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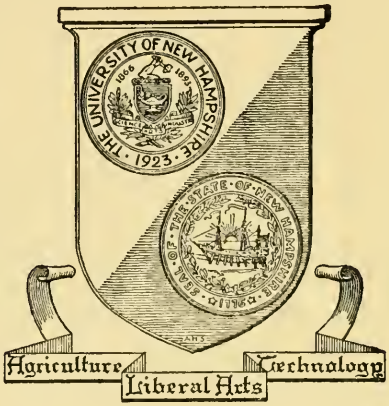

The University
of
New Hampshire

Bulletin 332 June, 1941

The Local Structure of Milk Prices In New Hampshire Markets

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THE LOCAL STRUCTURE OF MILK PRICES IN NEW HAMPSHIRE MARKETS[1]

By ALAN MACLEOD

The marketing of milk in the United States, once involving only a simple exchange between producer and ultimate consumer, has become progressively more intricate and complex, until today it represents one of the most complicated processes of assembling, distributing, and pricing undergone by any agricultural commodity.

As milk is produced more widely than any other agricultural product and is regarded as a food essential to proper nutrition, the way in which it is marketed affects almost everyone. Inefficiencies, either in the physical process of marketing or in the pricing of the milk at the various stages of its distribution, increase marketing costs and hence must either increase the cost of milk to the consumer or reduce the price received by the producer, or both.

These inefficiencies may be of two kinds: (1) physical inefficiencies in the use of equipment, personnel, etc., and (2) pricing inefficiencies which prevent smooth and rapid functioning of price-making forces in the market.

Within the past decade there has been a tremendous increase in regulative activity affecting milk marketing. For many years, agencies concerned with the quality and healthfulness of milk produced and sold have exercised authority over conditions of production and sale, but only recently has milk received the attention of regulative bodies primarily interested in controlling prices and conditions of sale. In New England there are now milk-control agencies in each of the six states and in addition the Federal Government has issued orders in Boston and several secondary markets.

These agencies endeavor to set and enforce milk prices. A good deal of variation exists in the methods used and in the extent to which prices are controlled. Federal control, for instance, limits attention to the prices which distributors pay for milk and the allowances which are made for performing the various services necessary to assemble milk from the farm to the city plant. State control agencies have followed the practice of setting resale prices as well as producer prices. There is now no market of any size in New England in which both the producer and resale prices are not administratively determined.

Another development which has affected the marketing of milk has been the increased concentration of distributive business in the hands of large organizations. In most major milk markets, one or two concerns now handle a large share of distribution. This concentration of power has also progressed far in the case of producers, who in many markets have formed powerful cooperative associations for marketing their milk.

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[1] This is a New Hampshire publication in the New England-wide milk marketing study, which is sponsored by the New England Research Council. Acknowledgment is made to Mary L. Geraghty for assistance with tabulations and to the New Hampshire Milk Control Board, the New Hampshire State Department of Agriculture, representatives both of cooperative associations and proprietary companies, and farmers who supplied information for this study.

Consequently, freely competitive conditions (in the economic sense) are rarely found. Instead, varying degrees of monopoly are the rule. Numbers of buyers and sellers are not "large". Recognition is given to the reaction of competitors. Products are differentiated.

Not only then is it necessary to reckon with a system in which monopolistic elements are important, but also with a system in which prices at all stages of the marketing process are determined by administrative action. Thus the possibility, postulated by classical economists, that economic forces would, if left alone, work in the direction of the maximum efficiency of production and distribution is no longer present in most milk markets.

With this divergence of conditions from those of perfect competition, and with the presence of administrative price making bodies, most milk markets are left without any automatic mechanism to bring prices and charges into proper alignment with conditions of consumption, production, and distribution.

Administrative agencies, if they are to introduce improved methods and remove inefficiencies in the distribution of milk, must have criteria to guide them in the determination of prices and allowances. The need for these arises from the influences which such prices and allowances as are set, have upon the amount of milk produced, where it is produced, the whole process of its assembly and distribution, and finally, its consumption. Indeed, in the absence of regulation or ownership of production and distribution, prices are the mechanism by which the whole productive and distributive picture is determined. Because of this prime importance of prices and allowances, the powers which a control agency assumes when it undertakes to set them, are extremely broad and far-reaching.

Without a knowledge of the effects of various price policies, only by accident will those prices be set which are in the public interest, or in the interests of the industry itself, (which two may or may not coincide). They may, if not actually leading to greater inefficiency, at least perpetuate present inefficiencies and discourage the introduction of new and improved methods. Present conditions are not a sound basis on which to build; they may be far from those which perfect competition would bring about.

It is here that the research worker can make an important contribution. All agencies concerned with the determination of prices and allowances, can function intelligently only when they understand the manner in which economic factors operate in the market. The research worker, by supplying this information, even for only a part of the marketing process, is rendering a service. Only through the understanding and use of such information can administered prices be set at levels which will encourage adoption of improved methods of production and distribution, equate consumption with production, and promote stability in the industry.

INTRODUCTION

This study of milk prices, together with the three studies of New Hampshire milk markets which preceded it, undertakes to supply infor-

mation of value to those concerned with the determination of milk prices and allowances. It attempts to provide a better basis than now exists for making decisions on price policy in New Hampshire milk markets.

After sketching briefly the historical background of milk prices in New Hampshire, the study shows that, under present conditions, in a typical market, prices are not derived from any scientific basis and are certainly not those prices which perfectly competitive conditions would bring about.

Likewise, when markets throughout the state are considered, prices are found to vary much more widely than any difference in transportation costs would justify.

The last part of the study investigates the market response of producers in two areas, to varying prices for milk. As might be inferred from earlier findings, the response of producers to large price differentials tended to be either retarded or overshadowed by the action of other factors.

In the first study of this series[1] a description of the characteristics and relationships of the supply areas furnishing milk, both to New Hampshire markets and the Boston market, was given. In this preliminary publication, price data did not appear. In addition to locating the farms producing milk for sale and indicating the markets in which that milk was sold, a description of the total sales in the various markets and the importance of different types of distributive agencies was given. The extent of the various milksheds was indicated, and the relationship of one market to another was presented in both tabular and graphic form. In this first publication prices were not considered.

The second publication of the series[2] described the manner in which milk moves to the market from the areas of supply reported on in the first publication. This study was limited to a consideration of the trucking of milk from the farm to the country station or city plant. Particular emphasis was laid upon the charges levied upon the milk, as these are commonly deducted from the farmer's check. In this study, prices obtained for milk at the market or paid to the farmer were not considered, and attention was centered solely upon the trucking charges. In addition to analyzing present rates charged, a theoretical analysis of the process of rate formation was included and present charges were considered from that standpoint.

The third publication[3] also dealt with milk transportation, emphasizing what might be termed the physical process of assembling milk from farms to plants, as contrasted to the preceding study which had to do with charges levied on this milk. Several schemes of reorganization were worked out for the south central part of the state.

THE PROBLEM

Despite widespread efforts by regulative agencies, cooperatives,

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[1] MacLeod, Alan, 'The Milksheds of New Hampshire," N. H. Agri. Exp. Sta. Bul. 295, 1937.

[2] MacLeod, Alan and Geraghty, Mary L., "The Transportation of New Hampshire Milk; I. Analysis of Trucking Charges," N. H. Agri. Exp. Sta. Bul. 307, 1938.

[3] MacLeod, Alan, "The Transportation of New Hampshire Milk; II. Reorganization of Truck Routes," N. H. Agri. Exp. Sta. Bul. 325, June 1940.

dealers and individual farmers, to influence, or even to set milk prices in New Hampshire, such efforts have usually rested on very uncertain bases. To such fundamental questions as: "What is the proper relationship of producer prices between two markets?", "What will be the effect on production of certain price policies?", and "What schedule of prices will bring stable market conditions?" no precise answers were available. While this study does not assume to answer all these questions, or even any one of them completely, it should provide information which will serve as a much better base than that which has previously been available.

Under the subject of prices, there are a number of distinct sub-divisions. Perhaps the first subject to be investigated is an historical one, the history of milk prices in New Hampshire. Accordingly, a brief account of the historical background of present prices is presented in the next section of this report.

Having sketched the background, the next topic studied is the present price structure in the market. By taking prices paid by the various dealers in New Hampshire and Boston markets and making the appropriate deductions from those prices, we may obtain a cross section of prices actually received by producers in different parts of New Hampshire. Such a cross section will indicate the actual producer price at the farm for milk of 3.7 percent butterfat at a particular point of time and will show the relationships of markets to one another at that time.

It is realized that such cross section analysis gives little information on the actual price relationships which have obtained in past periods and which presumably have influenced production into its present structure. Such information, however, will be analyzed in another portion of this price study, in which sample areas where two or more markets compete for milk have been selected for detailed analysis of the effect of various producer prices on the market in which that production was sold.

In these sample areas, detailed information for an eight-year period regarding individual prices received and method of payments form the basis of the study. A section of this study has to do with producers' response to prices in regard to the markets in which milk is sold.

As an indication of the dangers incident to price-fixing where price data are either lacking or are disregarded, a brief account is given of an attempt at price fixing in the city of Berlin, New Hampshire, by the first New Hampshire Milk Control Board.

Finally, conclusions from this study together with those of the three preceding publications are brought together in a single section. Their usefulness to those concerned with milk prices is indicated and suggestions for applying the conclusions are made.

HISTORICAL BACKGROUND

Without a knowledge of the evolution of the supply situation, many of the present institutions and practices are difficult to understand. Accordingly, an attempt is now made to give an account of the changing supply factors in New Hampshire. In this section are presented only the more important developments and they are handled briefly, with no attempt at detailed or exhaustive treatment. This is not intended to be a

history, but rather is designed to provide background information for study of present conditions.

Production

The number of dairy cows in New Hampshire in 1940 is not greatly different from that reported in 1867. (Fig. 1, Table I). After increasing irregularly to a peak in 1904 of 125 thousand, cow numbers then commenced to decline until a low point of 75 thousand was reached in 1928. During the past decade cow numbers have averaged 82 thousand.

Production estimates are much less reliable than are estimates of cow numbers. Except for census figures there are no continuous series before 1929. Production in recent years is shown in Table II. The census figures, though erratic, go back to 1889 and are presented in Table III.

Markets

While changes in cow numbers and volume of production have been

TABLE I. NEW HAMPSHIRE—NUMBER OF MILK COWS IN THOUSANDS ON FARMS

JANUARY 1, 1867 — 1940

Year	Number	Year	Number	Year	Number	Year	Number
1867	88	86	97	05	125	24	86
68	90	87	102	06	121	25	85
69	95	88	107	07	117	26	80
1870	96	89	112	08	112	27	76
71	95	1890	116	09	106	28	75
72	88	91	118	1910	100	29	77
73	90	92	115	11	102	1930	78
74	93	93	116	12	101	31	81
75	95	94	113	13	98	32	84
76	98	95	111	14	94	33	85
77	100	96	110	15	96	34	87
78	103	97	114	16	95	35	86
79	105	98	116	17	97	36	82
1880	105	99	118	18	101	37	80
81	105	1900	119	19	98	38	78
82	104	01	119	1920	98	39	79
83	98	02	120	21	96	1940	79
84	98	03	124	22	94	(Preliminary)	
85	96	04	125	23	90		

(Cows and heifers 2 yr. old and over, kept for milk) Source: U. S. D. A. B. A. E. Livestock on Farms, Jan. 1, 1867-1919—revised estimates Washington, D. C., Jan. 1938 for 1867-1935, 1936-1939, Agri. Stat. 1939.

large, they are by no means as striking as the changes which have taken place in the assembling and marketing of milk in New Hampshire within the past 50 years.

Shipments of fluid milk to Boston out of New Hampshire were recorded in the 1850's and perhaps began even earlier.

"These early shipments were made by peddlers who brought into the city the milk which they needed for their retail trade. But as the business increased, there happened what has taken place in every other industry — specialization. Handling milk at wholesale became a business distinct from retailing, and the men who brought in railroad milk came in time to devote the whole of their energy and capital to buying milk of the farmers, transporting it, and selling it to retailers." [1]

Shipment out of New Hampshire to Boston in 1897 was entirely by rail. Producers sold milk delivered to the car at the railroad station. This milk was handled almost entirely in wooden stoppered, 8½ quart cans.

In 1898, Whitaker indicated the area of New Hampshire out of which shipments of fluid milk were being made to Boston, as extending as far north and west as East Lebanon, N. H., Newport, N. H., and Bellows Falls, Vt.

Writing in 1905, seven years later, he[2] mentioned producers as far north as Lancaster, shipping milk to Boston. Presumably the Boston milk-

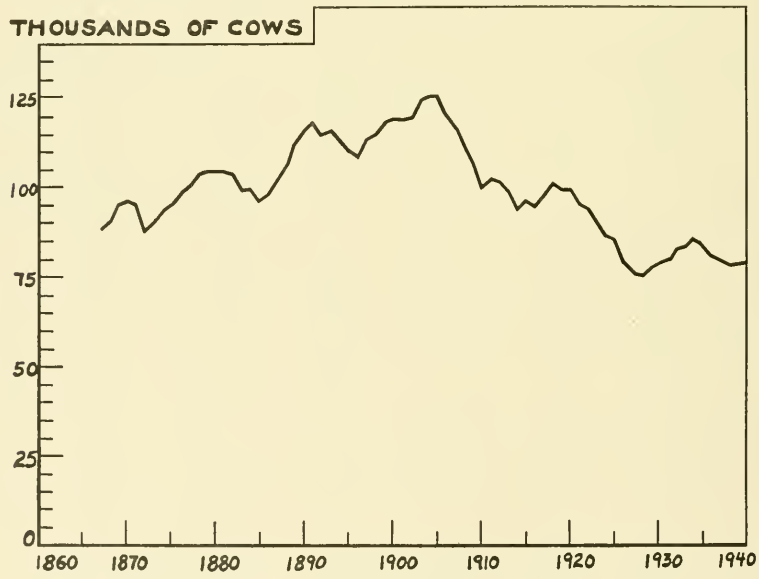


FIG. 1. NUMBER OF MILK COWS ON NEW HAMPSHIRE FARMS, JANUARY 1, 1867-1940 [1]

[1] For data on which this figure is based, see Appendix Table I.

[1] Whitaker, George M., "The Milk Supply of Boston and other New England Cities," U. S. D. A. Bur. of Dairy Industry Bul. 20, 1898.
[2] Whitaker, George M., "The Milk Supply of Boston, New York, and Philadelphia," U. S. D. A. Bur. of Animal Industry Bul. 81, 1905.

TABLE II. TOTAL PRODUCTION OF MILK ON NEW HAMPSHIRE FARM IN MILLIONS OF POUNDS [1]

Year	Production	Year	Production
1929	360	1935	378
30	372	36	372
31	374	37	355
32	372	38	355
33	380	39	354[2]
34	381		

Source — Yearbooks of Agriculture
[1] Excluding milk spilled or wasted on farms and milk sucked by calves.
[2] Preliminary.

TABLE III. MILK PRODUCTION IN MILLION GALLONS IN NEW HAMPSHIRE, 1889-1934

Year	Production	Year	Production
1889	42.6	1924	38.1[1]
1889	60.7	1929	40.7
1909	35.0	1934	42.9
1919	42.6[1]		

Source — U. S. Census Reports
[1] Includes estimates for incomplete reports.

shed then embraced much the same area as it does now, the most important difference being that no milk was received from the Colebrook area, now a source of heavy shipments. It was not until some ten years later that the Boston milkshed had extended to the extreme north of New Hampshire.

Shipments outside the state comprise less than half the milk produced in New Hampshire at the present time.[1] Only a part of the out-of-state shipments go to Boston. The quantities of New Hampshire milk going into different products and markets at various times in the past are not known accurately. One thing certain, however, is that the fluid milk consumed by residents of the state is now, and always has been, supplied almost entirely by New Hampshire farms.

Census data presented in Table IV and figure 2 show the trend in utilization of New Hampshire milk. In 1849, except for fluid milk and cream sold locally, dairy butter and dairy cheese were the commercial outlets of prime importance. The dairy cheese industry declined rapidly until 1899 when only slightly more than 3 per cent of the 1849 quantity was reported. Dairy butter production moved irregularly until it reached a peak in 1889, after which it began a decline which has been uninterrupted ever since. Creamery production of both butter and cheese became important in the last two decades of the 19th century, rising to a peak about 1890,[2] and then after a brief period of stability, began to decline until at the present time negligible quantities of creamery butter and cheese are produced in New Hampshire.

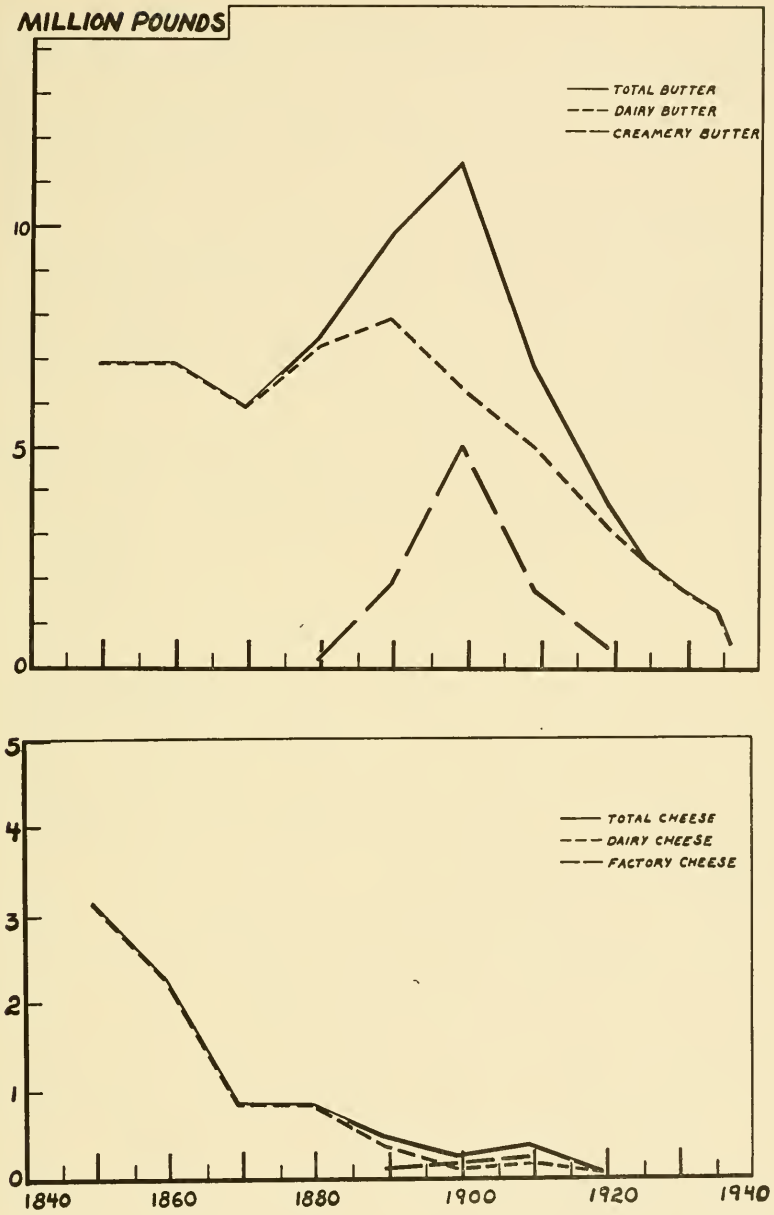
[1] MacLeod, Alan, "The Milksheds of New Hampshire," N. H. Agri. Expt. Sta., Bul. 295, 1937.

[2] Davis, L. M., "A survey of the Dairy Marketing Conditions and Methods in New Hampshire," N. H. Agri. Ext. Bul. 8, 1917.

TABLE IV. DISPOSAL OF MILK PRODUCED IN NEW HAMPSHIRE, 1849 - 1937

	1849	1859	1869	1879	1889	1899	1909	1919	1924	1929	1934	1937
Milk produced (1,000 gallons)					42,633	60,725	35,033	42,556[1]	38,149[1]	40,680	42,928	
Milk sold (1,000 gallons)			2,353	5,739		28,988	21,132	23,043	21,017	29,403		
Cream sold (1,000 gallons)						553	381	265	255	160[2]		
Butterfat sold (1,000 pounds)							566	759	1,375	427[3]		330[4]
Dairy butter produced (1,000 pounds)	6,977	6,957	5,965	7,247	7,943	6,386	5,065	3,240	2,470	1,768	1,324	660[4]
Creamery butter produced (1,000 pounds)				99	1,920	5,043	1,740	517				
Dairy cheese produced (1,000 pounds)	3,197	2,232	849	807	341	104	181	32				
Factory cheese produced (1,000 pounds)					103	117	184	not given				

Source — U. S. Census
[1] Includes estimates for incomplete reports
[2] "Cream sold not as butterfat"
[3] "Cream sold as butterfat"
[4] From Agricultural Statistics 1939



Source — U. S. Census

FIG. 2. BUTTER AND CHEESE PRODUCED IN NEW HAMPSHIRE, 1849-1937

As described earlier in this section, as production of butter and cheese was declining, sales of fluid milk and cream were increasing. Fluid milk is now by far the most important outlet for New Hampshire milk,

with large quantities of milk used as fluid cream in flush periods of the year.

Methods of Payment

All sorts of different bases for payment for milk have been used in New Hampshire. While much milk has been (and still is) sold on a flat price basis of so much per quart, regardless of butter-fat content, evenness of production, etc., large amounts have changed hands on the basis of intricate price formulas.

At the time when shipment of fluid milk to Boston began to be of importance to New Hampshire dairymen, payments were made on the basis of a theoretical Boston price.[1] Farm prices were calculated by deducting varying amounts from the Boston price depending on the distance from Boston of the station to which the milk was delivered. Prices were adjusted twice a year, April 1 and October 1. (This situation existed at least during the period of 1874-1897.)

During the twelve years, 1886-97, theoretical Boston prices averaged 32¼ cents per 8½ quart can in summer and 36 3/5 cents in winter. From these prices, deductions depending on distance were made.

For stations between 17 and 23 miles from Boston	8 cents
23 and 36	9 cents
36 and 56	10 cents
56 and 76	11 cents

and 1 cent more for each additional 20 miles

These prices were agreed upon six months in advance, but the "joker" seems to have been that the stipulated price was only paid for such milk as was sold again, plus a small excess (5 per cent). All surplus beyond this was made into butter on the farmer's account, at a value of the average of the jobbing price for butter quoted by the Chamber of Commerce, the farmer being charged 4 cents per pound for making. In 1896 the butter value of the surplus milk, less the cost of making, was 13 cents per 8½ quart can, or slightly over 71 cents per cwt. In 1897, surplus averaged 13 1/3 cents per 8½ quarts.

The amount of surplus was sufficient in May, 1897 to reduce the composite price by 2.26 cents per 8½ quart can (about 12 cents per cwt.)

By 1905, the method of payment existing in the late 1890's had been changed.[2] Instead of being paid for surplus milk on the basis of its butter value, a method by which (within certain limits) the buyer agreed to take all milk at a flat price was put into effect. By this plan the price was cut 2 cents per 8½ quart can (about 11 cents per cwt.), the deduction being termed a "carrying charge." In addition to this "carrying charge" a type of rating plan was put into effect whereby producers delivering amounts varying from their ratings by more than one-sixth would receive a lower price. Ratings were to be based on farmers' predictions of intended production, adjusted pro rata to the probable demand in the market.

The diversity of methods of payment for milk had not disappeared

[1] Whitaker, George M., "The Milk Supply of Boston and other New England Cities," U. S. D. A. Bur. of Dairy Industry Bul. 20, 1898.
[2] Whitaker, George M., "The Milk Supply of Boston, New York, and Philadelphia," U. S. D. A. Bur. of Animal Industry Bul. 81, 1905.

by 1917, for in that year it was stated that "no uniform price basis, upon which payments for milk and cream are made, is in vogue in New Hampshire."[1] A number of different methods of payment then in common use were outlined, varying all the way from a flat price regardless of quality to complicated systems of premiums which sometimes included a "good will" item.

"The history of price plans in the Boston market is particularly interesting, not only because almost every type of price plan has been tried out at one time or another, but because they were worked out some years earlier than in any other market."[2] This continuous series if changes in price plans used by the Boston market has continued to the present.

Local markets in New Hampshire have tended to use either a flat price plan or a method of payment based upon the use of the milk, though variations of both these methods have been frequent. At the present time, most of the larger dealers who purchase milk in New Hampshire for sale either in Boston or in secondary Massachusetts and New Hampshire markets, buy on a use basis. Ordinarily, each dealer pools his purchases and pays a uniform price for milk of 3.7 per cent butter-fat to all his regular producers. Boston dealers are included in a market-wide pool and all producers shipping to that market receive a uniform price (subject to location, butter-fat differentials and association dues). Many of the small New Hampshire dealers, most of whom distribute in local markets, purchase on a flat price basis of so much per quart.

Prices Received

Average price series are not trustworthy because of the varied methods of payment used, and in earlier years, because of the scarcity of price quotations. But some indication of price movements is contained in Table V and figure 3.

This series indicates that following a period of relatively stable prices in 1910-16, during which about $2 per hundredweight was received for milk sold at wholesale, a sharp increase occurred until in 1920 a peak of $3.82 was reached. The next year prices dropped, but not to anywhere near their pre-war level, fluctuating between $2.55 and $3.05 until 1931 brought a further drop to $2.14. The last ten years have seen prices keep close to the $2.00 level, or slightly above pre-war.

PRODUCER PRICE RELATIONSHIPS WITHIN A SINGLE MARKET

In attempting to present milk prices in New Hampshire, even at a particular point of time, several problems present themselves. First of all, within a commodity such as milk which is purchased on different price bases, one is faced with many different choices. If interest is primarily in the operation of distributors, perhaps attention should be focused upon Class I and Class II prices with less attention paid to composite prices. Where producer prices are the prime interest there would seem to be more virtue in dealing with composite or base and surplus prices than with Class I and Class II prices. Furthermore, as at the present time,

[1] Davis, opus cit.

[2] Bacon, Lois B., "Institutional Factors Affecting the Marketing of Milk in Boston," Thesis presented to Radcliffe College, 1934.

TABLE V. PRICES RECEIVED BY NEW HAMPSHIRE FARMERS FOR MILK, WHOLESALE 1910 - 1939

	Farm Price Dollars per cwt.	Relative Price (1910-14—100)		Farm Price Dollars per cwt.	Relative Price (1910-14—100)
1910	1.89	96	1925	2.78	141
1911	1.90	96	1926	2.87	146
1912	1.94	99	1927	2.90	147
1913	2.08	106	1928	2.93	149
1914	2.03	103	1929	3.05	155
1915	2.02	103	1930	2.79	142
1916	2.13	108	1931	2.14	109
1917	2.77	141	1932	1.79	91
1918	3.68	187	1933	1.71	87
1919	3.75	190	1934	1.98	101
1920	3.82	194	1935	2.12	108
1921	2.97	151	1936	2.12	108
1922	2.55	130	1937	2.00	102
1923	2.90	147	1938	2.12	108
1924	2.71	138	1939	2.13	108

Farm price is annual average of monthly prices published by U. S. D. A. Crop Reporting Service.

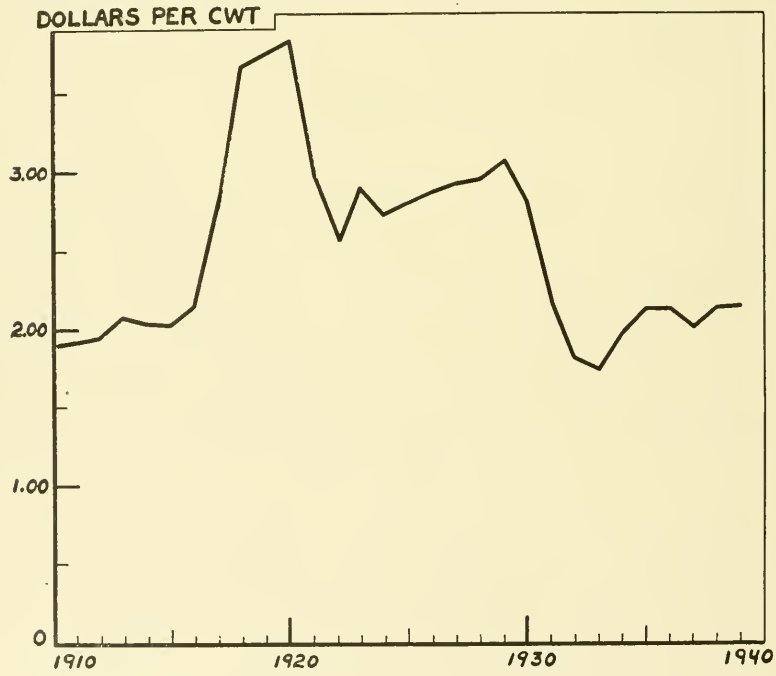


FIG. 3. PRICES RECEIVED BY NEW HAMPSHIRE FARMERS FOR MILK, WHOLESALE

only a relatively small number of dealers purchase on a base and surplus plan and most of them pay for milk on a composite plan, it seems advisable to pay particular attention to the latter.

In order that prices in the various markets might be comparable, a uniform period has been selected in which to make the comparison. This period is the month of March, 1939. Several factors were responsible for selection of this particular time. March is a month neither of scarcity nor surplus as far as milk production is concerned. It falls about midway between the short month of November and the flush month of June. The second factor influencing the selection of March, 1939, was that this was, at the time of commencing the collection of price data, the most recent complete month. Another factor in its favor was that this month was a relatively settled month as regards most of the milk markets. No very drastic price changes took place.

Data regarding prices in this month were obtained from several sources. Among these were the New Hampshire Milk Control Board, which furnished data for practically all New Hampshire markets; and the Boston Milk Administrator, who announced for the month of March the equalization prices at the various stations located in New Hampshire. While the prices paid by the Boston market were already announced in composite form and applied to milk delivered at the country stations, those obtained for New Hampshire markets were frequently expressed as Class I and Class II prices from which the composite prices had to be calculated. Various deductions had to be made before actual farm prices could be determined.

Most studies on prices of milk have dealt with averages. Such a procedure may be of great value in discovering trends and relationships, but it also tends to conceal many significant facts. Throughout this series of studies an attempt has been made to get behind the averages to the individual producer and distributor. This approach brought to light many interesting things when applied to the location of milksheds. It showed, for instance, that instead of having smooth, clearly defined boundaries producers are intermingled at the edge of two milksheds. An average expressed in terms of the boundary on a map would therefore not represent the actual situation at the edge of the milkshed.

The same is true in the case of producer prices and dealer prices, even in a particular market. By averaging the various producer prices in an area, many significant relationships between these prices are eliminated. For instance, two markets may be found to have approximate equal average prices to producers for milk. If such markets are adjacent, the conclusion may be drawn that because they have about the same average prices, producer prices will be about equal and a relatively stable relationship will exist. Actually, this may not be the case at all. Producers, even within one of the milksheds, may be receiving radically different prices and the comparison between the two markets may show striking differences in price relationships if individual producer prices are considered rather than average prices.

One of the difficulties in considering individual producer prices is that of summarizing and generalizing. In this study we have attempted to overcome such difficulties by the use of price charts.

In figure 4 an attempt has been made to present a typical New Hampshire market (Nashua) from the standpoint of the prices received

at the farm by producers. In preparing this chart, producers were arranged according to the price they received. Adjustments had to be made in those cases where producers hauled their own milk. The adjustment

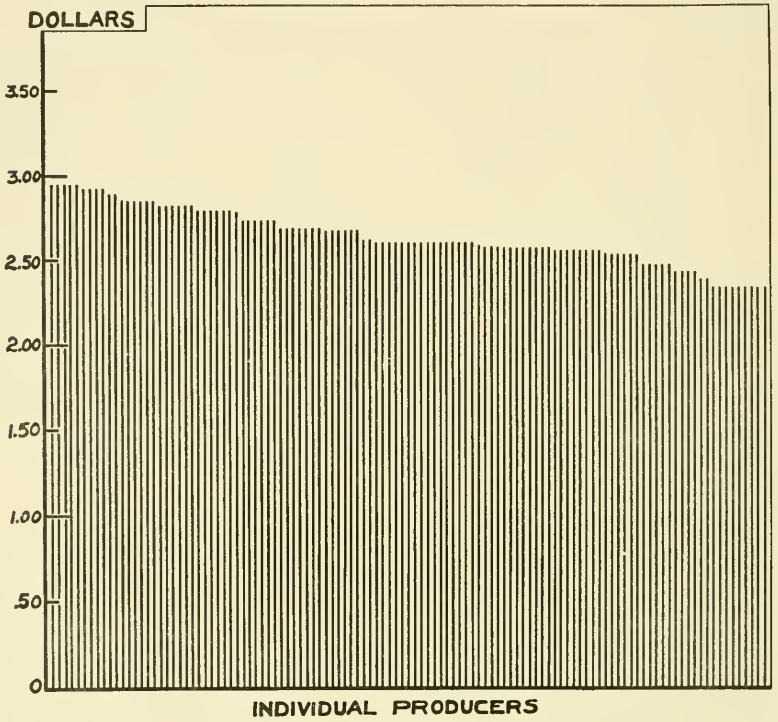


FIG. 4. PRICES RECEIVED AT THE FARM BY PRODUCERS SUPPLYING NASHUA, NEW HAMPSHIRE, MARCH, 1939[1]

1. For data on which this figure is based see Appendix Table I.

made in this case was to deduct from the composite price paid at the plant a transportation or hauling charge equal to that which the same dealer was charging other producers living in a similar locality. Where such data were not available, the deduction made was that corresponding to the average hauling charge paid by other producers in the same part of the milkshed.

The range in prices received by producers selling in Nashua is surprising, amounting to 62 cents or 26 per cent of the lowest price received. Nor is this range affected by a few extreme items; nine producers received $2.33 per cwt., the low figure, and five producers received $2.95 per cwt., the high extreme, out of a total of 113 producers included in the computations. These prices all refer to milk of 3.7 per cent butter-fat acceptable to the city health authorities. Unless other factors, such as distance from market, compensate for such price dispersion, considerations of theory would suggest that the market was inherently unstable and a shifting of producers from dealers paying low prices to those paying

high prices would occur, such shifting tending to eliminate the wide differences in prices in the market.

Before investigating the effect of location and the existence of other factors compensating for price differences, it is unsafe to draw any conclusions, but at this point it can be said that the Nashua market is an old, settled market, in which no radical changes or shifts in producer-dealer relationships have occurred in recent years.

In figure 4 the influence of distance from markets has not been taken into consideration and therefore variations in prices may be partly accounted for by difference in location of the farm, as well as differences in the distributor to whom milk was sold and the price paid by that distributor. Figure 5, therefore, has been prepared to show the effect of dis-

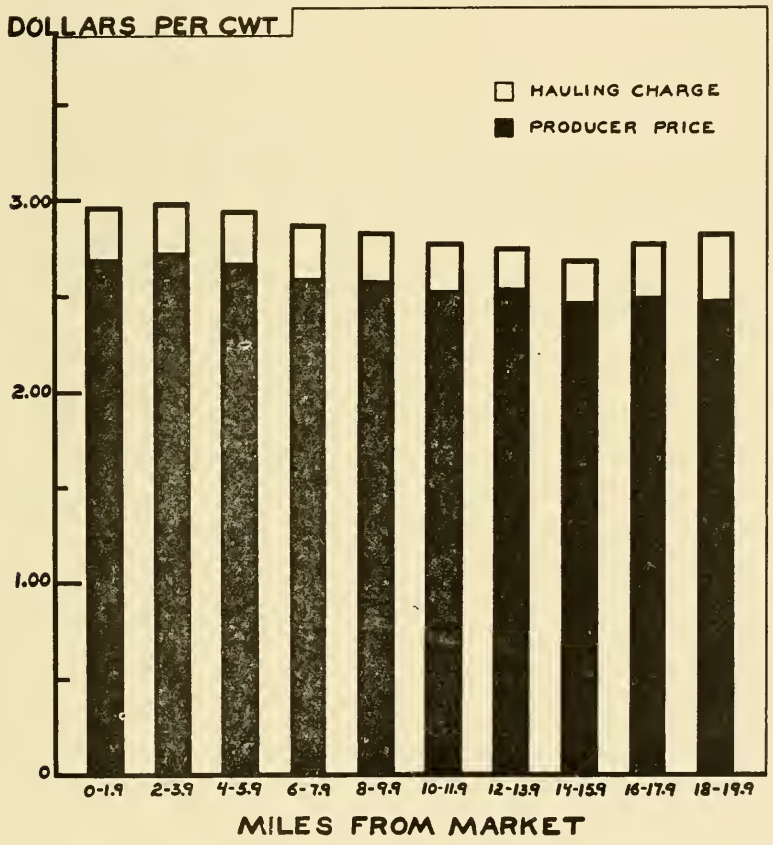


FIG. 5. PRODUCER PRICES AT VARIOUS DISTANCES FROM NASHUA, NEW HAMPSHIRE, MARCH, 1939 [1]

[1] For data on which this figure is based see Appendix Table II.

[1] In a later section of this study a chart will be presented to show the variation in prices received by individual producers within a particular distance from market. Again, it is evident that not the average but the dispersion is important in considering prices received for milk by producers.

tance from market. In this chart, producers' prices within a certain distance from market have been averaged and the average is presented in the chart.[1]

To show that price differences do not arise entirely, or even largely, from differences in hauling charges, the latter are also included in the chart. This is done in such a way that if transportation differences accounted for all the difference in prices between zones, the sum of zone prices plus transportation charges would be constant for all parts of the milkshed. A glance at figure 5 shows this is not so. Transportation charges to this market tend to *decrease* with distance from market.

Nevertheless, there is a general tendency for prices to decrease as distance from market increases. This tendency of prices to decrease with distance does not result from differences in hauling charges, (which in this market have the opposite effect) but rather from other differences which are to some extent even masked or offset by the hauling charge.

In many cases, the reason for this difference is that dealers buying from nearby producers tend to carry little or no Class II (surplus) milk and to pay, therefore, on a higher composite basis than those purchasing from producers living at greater distances from the market. This tendency may partly be accounted for by the ease with which producers living close to the market may get into retail distribution should prices received from dealers not be satisfactory. Those living at greater distances perhaps have no such alternative and must, therefore, accept a much lower price before they are forced into either retail distribution or to selling in other markets located at even greater distances from their farms.

In figure 6 the individual prices received within a given range of miles from market are presented. This chart indicates that even within a group of producers located the same distance from market there are substantial differences in the prices which they received. These differences are particularly evident when several dealers purchase in the same area, but are even present when all the producers deliver their milk through the one dealer. Had more dealers purchased on rating plans the dispersion of prices within an area probably would have increased.

The data so far presented indicate that rather than being the exception, variation among producer prices is the rule. Undoubtedly, though these prices are calculated on 3.7 milk, some of the differences may be attributable to quality factors, both from a sanitary standpoint and from a butter-fat content. There is much evidence, however, to prove that quality factors by no means account for all or even a large portion of the differences in price. Strength of bargaining power is one factor that may cause prices to differ. Where producers have access to several different dealers, they are more likely to obtain a relatively high price than where a producer has only one possible market outlet. The location of truck routes has much to do with the bargaining position of a particular producer. If located favorably with regard to one or more truck routes, a producer is in a much more favorable position to bargain for the sale of his milk than if situated at some distance from a route now operating. This factor of location is important in explaining why some producers have much greater bargaining power than others.

PRICE RELATIONSHIPS BETWEEN MARKETS

So far, we have considered the price structure of the supply side of a particular market. The next subject is that of determining the structure

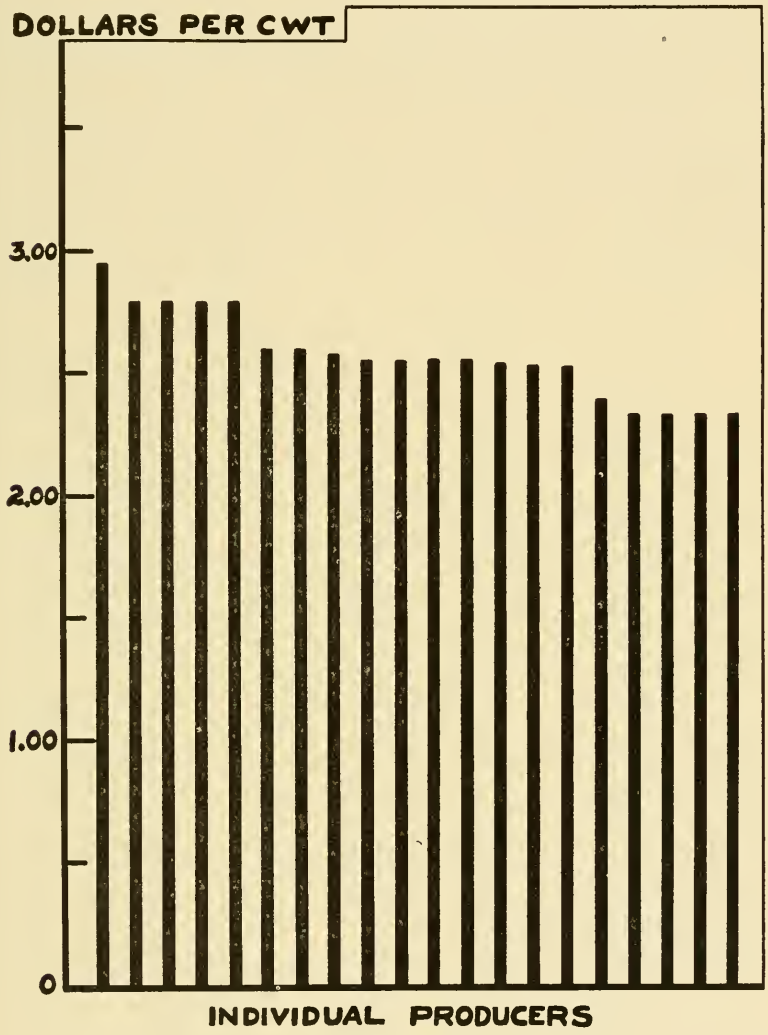


FIG. 6. INDIVIDUAL PRODUCER PRICES RECEIVED WITHIN A GIVEN RANGE OF MILES FROM A TYPICAL NEW HAMPSHIRE MARKET, 1939[1]

[1] For data on which this figure is based, see Appendix Table III.

of prices between different markets. Figure 7 and Table VI show the average prices paid for milk at delivery points throughout New Hampshire in

[1] Swonger, C. W., "A Study of Milk Marketing Conditions in the Boston Milkshed," New England Milk Producers' Association, 1939.

March, 1939. These prices are composite prices and are for market milk of 3.7 per cent butter-fat. They have been weighted by quantities delivered (in a few instances, approximations of deliveries have been made on the basis of quantities sold).

The normal seasonal movement in Boston composite prices is much greater than that in most secondary New Hampshire markets. Consequently, the particular period during which the comparison is made may influence greatly the price relations between various markets. In this connection, however, an index of seasonal variation in the Boston market for the period 1920-38 has shown the month of March to represent 98.8 per cent of the average for the year.[1] In this computation, March showed less deviation from the average of the year than any other single month. Thus while prices for a particular year may vary widely from the seasonal movement suggested above, it is reasonable to assume that the relationship

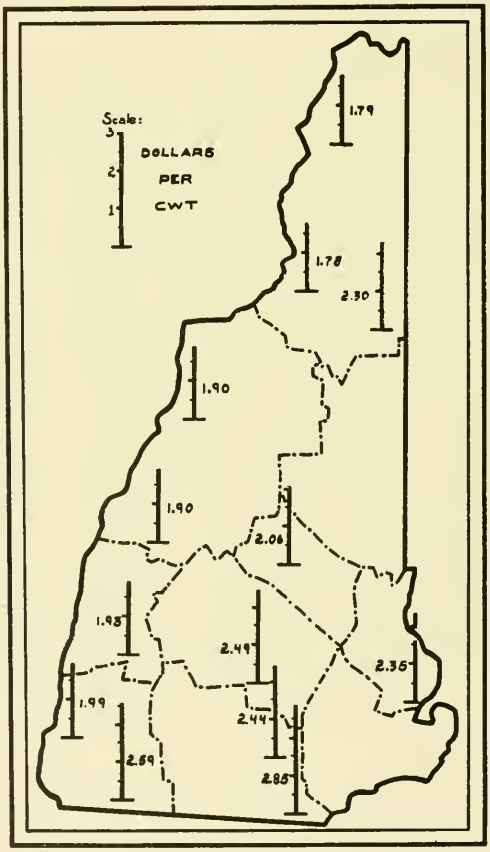


FIG. 7. AVERAGE PRICES RECEIVED BY PRODUCERS AT VARIOUS NEW HAMPSHIRE, MARKETS, MARCH, 1939[1].

shown in March, 1939, between the Boston market and other markets, was as typical as if any other recent month had been taken for purposes of this comparison.

Figure 7 shows that in a "normal month" there exist a number of different prices and that a range in prices of over 50 per cent is not unusual. Had other months besides March been considered, this range would have been found to have changed—the extent of the change depending on three factors: (1) the Class I prices in the various markets; (2) the Class II prices, and (3) the proportion of Class I and Class II milk in the different markets.

TABLE VI. AVERAGE PRICES PAID FOR MILK AT DELIVERY POINTS IN NEW HAMPSHIRE, MARCH, 1939

Delivery point[1]	Price per cwt. (dollars)	Delivery point[1]	Price per cwt. (dollars)
Nashua	2.848	Newport	1.930
Keene	2.590	West Canaan	1.898
Concord	2.491	Haverhill	1.898
Manchester	2.444	West Rumney	1.876
Portsmouth	2.352	Colebrook	1.792
Berlin	2.307	Lisbon	1.783
Laconia	2.055	Lancaster	1.780
North Walpole	1.991		

These factors do not necessarily work in the same direction in different markets. This is illustrated by figure 8, which shows the relative prices paid at the plant for 3.7 per cent milk sold to three markets and delivered at North Haverhill, East Haverhill, and Berlin, N. H. (The three markets are respectively, Boston, Mass., Manchester, N. H., and Berlin, N. H.)

Two markets can have the same Class I prices and the same Class II prices and still exhibit differing seasonal movement of prices. That market which customarily carries the largest proportion of Class II milk is likely to have the widest seasonal movement of composite prices. Two factors are largely responsible for this. They are: first, the tendency of the market which normally carries more Class II milk to be better equipped to handle Class II and so receive more than its proportionate share of any seasonal increase in milk production, and second, the tendency for Class II prices to vary inversely with the production of milk, thus adding to the seasonal swing of the composite price.

Considerations of theory would suggest that where a number of small secondary markets are located in the milkshed of a large primary market, prices at various points would bear some relationship to the distance from the primary market, even though the milk is sold in one of the secondary markets.[1]

Subject to the qualifications discussed earlier in this section, prices in March, 1939 as shown in figure 7 represent an attempt to show relationships between markets. The effect of location on price is shown distinctly,

[1] Approximate, often includes two or more plants in same neighborhood.

[1] See Gaumnitz, E. W., and Reed, O. M., "Some Problems Involved in Establishing Milk Prices," U. S. D. A. 1937
Cassels, John M., "A Study of Fluid Milk Prices," Harvard University, 1937
Black, J. D., "The Dairy Industry and the A. A. A.," The Brookings Institution, 1935.

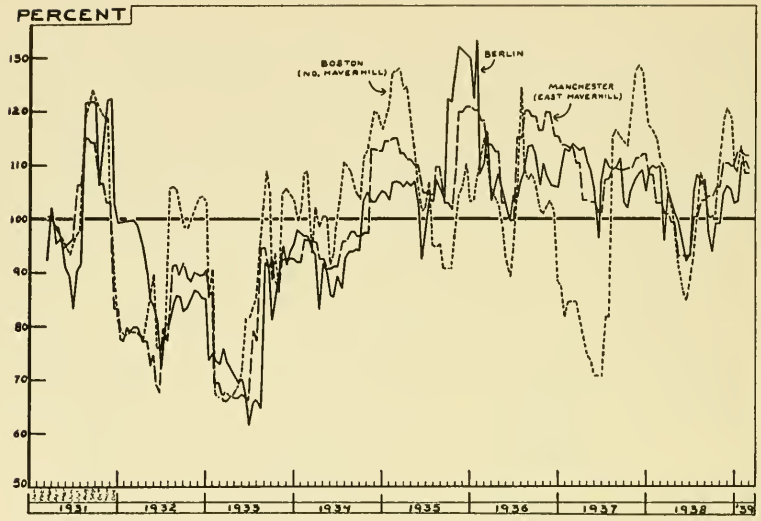


FIG. 8. RELATIVE PRICES PAID AT THE PLANT FOR 3.7 MILK SOLD TO THREE MARKETS [1]

[1] For data on which this figure is based, see Appendix Table IV.

and while based on only a cross section analysis, this chart does give some idea of the magnitude of price differences between delivery points located at different distances from the primary market.

Prices vary from an average of $2.848 for Nashua, N. H. (in the southern part of New Hampshire and within 40 miles of Boston) to $1.780 in Lancaster, in the northern part of the state. This maximum difference of $1.068 is much greater than can be accounted for by differences in transportation costs to the Boston market. Taking into account the location differential of 46 cents per hundredweight which producers located within 40 miles of Boston receive and the transportation costs, the difference between prices at Nashua and Lancaster would be only about 60 cents per cwt. (assuming milk at Nashua were shipped by rail).

Whether or not the price structure as shown in figure 7 will be stable is a question upon which some light is shed in a later part of this report. The immediate explanation of the price differentials between markets in the south and north of New Hampshire is that the former are largely local secondary markets while the latter are delivery points to the Boston market. Whether because of provisions in the Federal Order for the Boston market or for other reasons,[1] in the past few years the Boston market has carried a very much greater proportion of Class II milk, than have secondary New Hampshire markets. This resulted in higher composite prices returned by local markets than the Boston market, even though the latter market might have a higher Class I price.

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[1] See the statement regarding Order No. 27 (The New York Order) by S. McLean Buckingham, Milk Administrator, State of Connecticut, March 1, 1940 (mimeographed).

PRODUCERS' RESPONSE TO PRICE

Farmers respond to price in many ways. These responses can be grouped in two categories: first, responses having to do with production, either the amount produced, the methods of production used or the product; and second, responses which have to do with marketing, i.e., where, and in what form, the product is sold. While this classification is not sharp, a useful distinction can be made between supply responses affecting production and those affecting marketing.

The former group of supply responses, (those affecting production) have received attention from many students.[1] This is particularly true as far as the short time responses of milk producers are concerned.

Despite the many aspects of milk producers' response to price which remain unexplained, this study makes no attempt to investigate the field of production responses. Instead, efforts are concentrated on marketing responses, a phase of the subject which has received much less attention from students.

With widespread price fixing, it is becoming more and more desirable to have some knowledge of the extent of price differentials and the length of period required to influence producers to transfer from one market to another. At the present time it is sometimes said that there is a tendency for prices of two different markets in the same territory to approach equality, other factors being equal. But there is little evidence to support such a statement, even when it is qualified with that convenient phrase "in the long run."

In attempting to throw some light on this matter of producers' response to differing prices in two markets, two areas in New Hampshire were selected. Selection of these particular areas was carefully made. Using the individual producer maps described in the first publication of this series,[2] those areas where two milksheds overlapped were located. Of seven of these, the two in which intermingling of producers, non-interference of a local market which might offer the alternative of retail distribution, and availability of price records all seemed most propitious, were selected.

These two were the town of Jefferson, where Boston, Mass. and Berlin, N. H. compete for milk, and the town of Haverhill, where Boston and Manchester, N. H. compete for milk. The location of these areas is indicated in figure 9. In both of these areas the competition is between wholesale outlets, truck routes of the two markets intermingle and there has been some shifting of producers between markets.

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[1]For example see:
Allen, R. H., Hole, Erling, and Mighell, R. L., "Supply Responses in Milk Production in the Cabot-Marshfield Area, Vermont," U. S. D. A. Tech. Bul. 709, 1940.
Cassels, J. M., and Malenbaum, Wilfred, "Doubts About Statistical Supply Analysis," Jour. Farm Econ. 20, 448-461, 1938.
Ezekial, Mordecai, Rauchenstein, Emil, and Wells, O. V., "Farmers' Response to Price in the Production of Market Milk," U. S. D. A., B. A. E. mimeograph, 1932.
Gans, A. R., "Elasticity of Supply of Milk from Vermont Plants, I The Milk Feed-Price Ratio," Vermont Agri. Expt. Sta. Bul. 269, 1927.
Johnson, S. M., "Elasticity of Supply of Milk from Vermont Plants, II Factors Affecting Deliveries in Cabot and Marshfield, Vt., 1920-1935," Vermont Agri. Expt. Sta. Bul. 429, 1937.
Parsons, M. S., "Effect of Changes in Milk and Feed Prices and in Other Factors Upon Milk Production in New York," N. Y. (Cornell) Agri. Expt. Sta. Bul. 688, 1938.

[2]MacLeod, opus cit. 1937.

In these markets, price data were obtained over as long a period as possible, and in such detail that individual price records for each farmer were secured. From these records, composite prices received for 3.7 per cent milk at the farmstead were calculated. This was done to obtain the price which actually was received by each producer at his farm, and

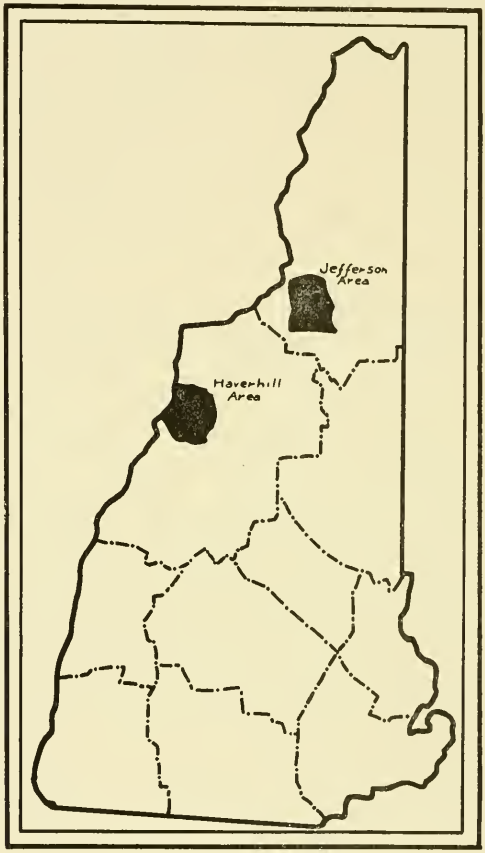

FIG. 9. OUTLINE MAP OF NEW HAMPSHIRE SHOWING AREAS IN WHICH MARKET COMPETITION WAS STUDIED

therefore, theoretically at least, the price to which he would react in deciding whether or not to sell in a particular market.

These price records, of course, indicated when a producer shifted markets but supplied no information about why the shift was made. In an attempt to answer this question, all producers were interviewed and their reasons for selling to particular markets were obtained (insofar as they were willing and able to give them). Finally all available data were taken into consideration in the analysis.

THE HAVERHILL, N. H. AREA

The Boston market through a country station in the village of North Haverhill, and the Manchester, N. H. market through a station in East Haverhill, compete for milk in the town of Haverhill. Figure 10 shows the situation as it existed in the spring of 1939, individual farms being represented by circles and squares. The market to which milk is sold is indicated by the symbol used.

Historical

Haverhill, N. H. is situated in the Connecticut River Valley in the western part of the state. (See figure 9 for location of the area). For a number of years, a country station located in the village of North Haverhill has shipped milk to Boston and one at East Haverhill has shipped to Manchester. By selecting an area which at some points includes small parts

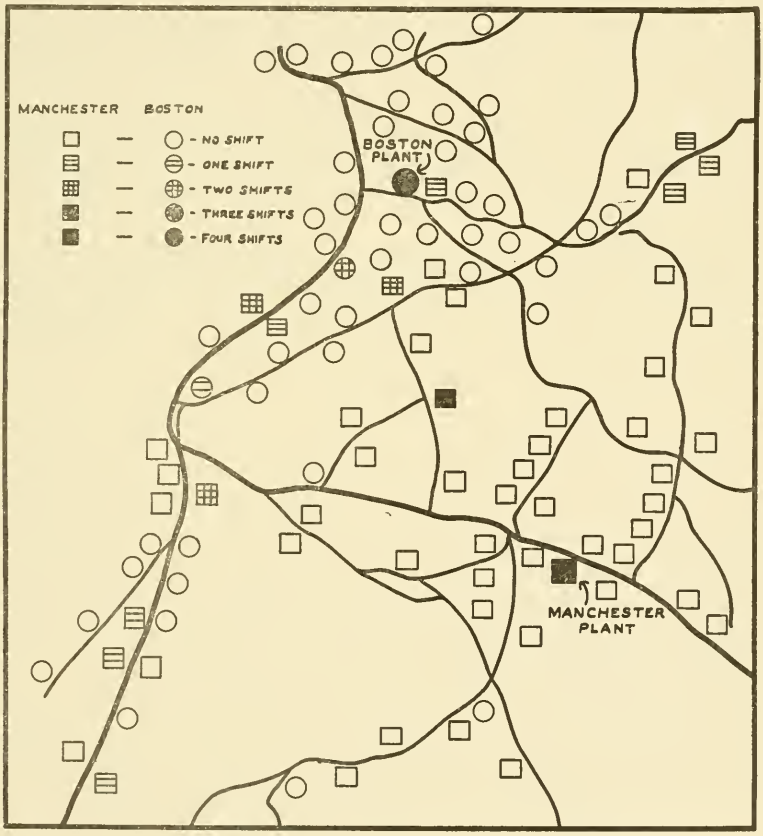

FIG. 10. HAVERHILL AREA SHOWING LOCATION OF FARM, NUMBER OF MARKET SHIFTS, AND MARKET IN MARCH, 1939

of adjacent towns while at the same time sections of Haverhill are not included, the influence of outside markets can be largely eliminated and the study can be confined to producers who have the two alternative markets from which to choose.

The two country stations had been in existence for a number of years before March, 1931, the beginning of the period under study. The Boston station, until December, 1936, was a Grade A station and producers selling to it were in a position to obtain Grade A premiums for milk of that quality. Aside from these premiums, producers generally enjoyed favorable bases under a base rating system. This is indicated by the premium which Boston shippers enjoyed at North Haverhill over those delivering milk to Lancaster, a premium much greater than differences in freight rates would justify. (Appendix Tables 5 and 6).

In December 1936, a strike was called by some of the cooperatives supplying the Boston market and many Haverhill producers diverted milk from the North Haverhill plant to cooperative plants elsewhere. Ownership of the plant changed hands early the following year and most of these producers returned to North Haverhill. Following the change in ownership, Grade A premiums were no longer paid and the base-rating system was abandoned.

Shipments to Manchester from the country plant at East Haverhill began in the twenties and have continued ever since, the plant being operated by one of the largest distributors in that city. All through the period covered by the study, milk delivered to this plant was purchased on a base and surplus system.

Conditions in the Haverhill area have remained relatively stable throughout the period of this study. Except for a short time during the milk strike and change in plant ownership in 1936-37, producer-dealer relationships were good, and as shown in figure 10, shifting between markets was infrequent.

Price Relationships Between Manchester, New Hampshire and Boston

Selection of a price basis for comparing the relative attractiveness of two markets to the producer offers several difficulties. Illustrative of them, is the question of whether or not association dues should be deducted. From one standpoint, a portion, at least, of such dues may be regarded as capital investment, later to yield a return to the producer, and represented by a certificate of some kind. Another viewpoint would deduct all such dues on the grounds that insofar as present and past returns are concerned, the actual prices received after all deductions are made, are most significant. Similar difficulties arise all along the line.

No completely satisfactory price series can be selected for the purpose of determining the prices to which producers react in selecting their markets. Different producers pay attention to different price quotations. Some apparently make their decisions on the basis of prices quoted for "base" milk at the plant, others consider prices for all milk at the farm, some deduct hauling charges and dues, some deduct neither and some, one but not both. Often, prices quoted by producers do not refer to milk of the same butterfat content, and faulty price comparisons may result.

This confusion and lack of uniformity in the price quotations to which producers pay attention, prevents the selection of any one of them as the one to which all producers react. Instead, that price comparison to which the producer would react, if he made his decision on the basis of the price which would have returned him the greatest net income at the farm (setting aside for the moment the many other factors which must be taken into consideration) is selected.

Using this criterion, the price series used in this comparison are composite prices with trucking costs and association dues deducted, expressed on a 3.7 per cent butter fat basis; i.e., net prices on the farm. The average prices presented are calculated by deducting typical transportation charges from not only prices received by those who send their milk on commercial routes, but also those who haul their own milk to the dealer's plant. The situation on a particular farm may vary slightly from this average but not sufficiently to nullify the comparison. Prices are calculated to a uniform butterfat content, and refer to milk of market grade. Premiums received for Grade A milk have not been included.

This price comparison is presented in figure 11, which shows the differential of Manchester prices over Boston prices and the percentage of producers in the area studied, selling to Manchester.

Manchester prices, over the whole period, have averaged 4.3 cents over Boston (at the farm in Haverhill). For the first half, 1931-34, Manchester prices were at a discount of 7.2 cents under Boston, while in the years 1935-38, they averaged 15.9 cents premium over Boston. (These statements, along with others in this and the following sections, refer to what might be termed the general level of prices and do not imply that there have not been short periods during which price relationships have been reversed.)

Until 1936, both markets purchased milk on a base-rating plan, but following December of that year, Boston shippers have sold on a composite or flat price basis.

Factors Other Than Price Which Influenced Haverhill Producers in Their Choice of a Market

In attempting to learn the reason why producers sold in the markets in which they did, much was discovered regarding the factors other than price which operate in an area to influence market outlet.

First, and most important, is that producers are seldom free to shift from one market to another at their own convenience. Many handlers limit the number of producers or the amount of milk which they will purchase, and even though producers may wish to sell to them, no means of "getting into the market" exists. Another way in which free movement of producers may be limited, is through existing contracts with the present sales agency which prevent release of a producer to another market except after a certain length of time.

Another deterrent to the shifting of markets is the use of a base-rating system or some similar device, whereby a new producer has to take, for a time, a lower price than do regular producers.

Producers sometimes are influenced in their choice of markets by the manner in which prices are quoted. Different methods of payment and price quoting may make it difficult for producers to compare prices with any degree of accuracy.

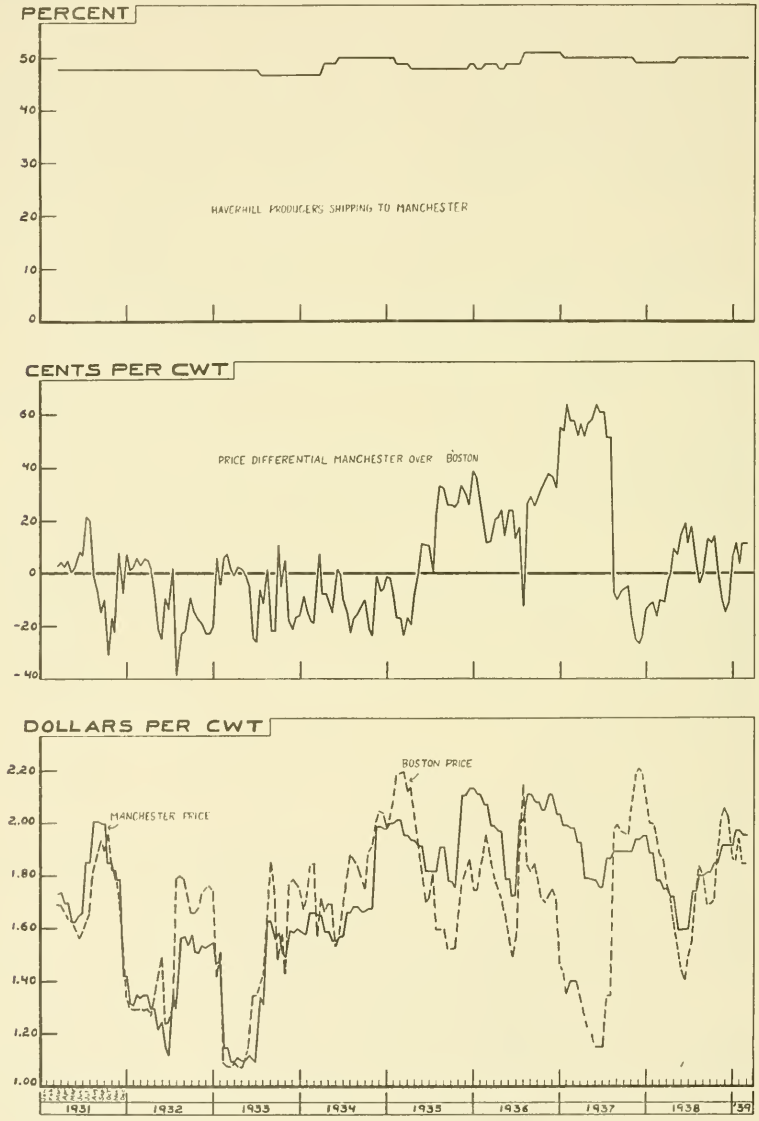

FIG. 11. PRICES RECEIVED AT THE FARM FROM THE BOSTON AND MANCHESTER MARKETS AND DIFFERENTIAL OF MANCHESTER OVER BOSTON TOGETHER WITH THE PERCENTAGE OF HAVERHILL PRODUCERS SHIPPING TO MANCHESTER.[1]

[1] For data on which this figure is based, see Appendix Table V.

Still other factors tending to prevent easy transfer of producers from one market to another are those associated with personal likes and dislikes. Loyalties built up between producer and dealer or producer and hauler may require large price differences to be broken down. Likewise, strong dislikes may prevent producers from supplying a particular handler. In this connection might be included the suspicion on the part of producers that certain handlers misuse the rating system or report false butterfat percentages or, in one way or another, continue to defraud their producers of a part of the milk price. While the most of such suspicions may be entirely unfounded, this does not prevent their being a potent influence in determining to what handler milk is sold.

Health regulations are often an important factor in preventing easy movement of producers from one market to another. Equipment requirements are apt to differ and expense be involved in qualifying to ship to a new market.

The importance in the Haverhill area of these factors affecting producers' market responses varied. Base-ratings, limitations by handlers on taking on new producers, contracts to deliver to a particular plant and other such deterrents to easy movement between markets have been important influnces in Haverhill. Another factor which undoubtedly has had an effect has been the availability of a market for Grade A milk at North Haverhill. Where producers could comply with requirements, the additional potential return from shipping to that station greatly affected producers' selection of a market.

As mentioned earlier, many of the Haverhill producers shipping to the Boston market possessed unusually satisfactory base-ratings, which they were reluctant to lose. This factor, while it endured only to the end of 1936, was undoubtedly a strong influence against leaving the Boston market during the first two thirds of the period studied. On the other hand, the opportunity to obtain immediately such base-ratings was not open to producers leaving the Manchester market; the securing of a satisfactory base-rating only followed continuous delivery for some time.

Difference in the method of price quotation, sometimes an obstacle to comparison of prices offered a producer by different market outlets, was not an important factor in Haverhill. While during the latter part of the period studied, the Manchester market purchased on a base and surplus basis and the Boston market on a composite basis, prices quoted were on a per hundredweight scale and butterfat differentials were the same or similar.

Such factors as personal likes and dislikes have been important in Haverhill, as they are in almost all markets.

Two factors which are sometimes important did not have much prominence in Haverhill. These are (1) a difference in markets with regard to the handler accepting all of a producer's milk even in the flush season, and (2) a difference in the producer's estimate of handler's financial strength. Neither of these two factors was mentioned by producers in Haverhill as influencing their choice of market.

Information on the enforcement of sanitary regulations is difficult to obtain but studies made about 1937[1] indicated that Boston requirements did not differ greatly from those of Manchester, and that enforcement policies were similar.

Market Responses of Producers in Haverhill, New Hampshire

The problem of determining producers' market response to price is vastly complicated by two sets of circumstances. First, many factors such as personal likes and dislikes, confidence in financial soundness of dealers and accuracy of weight and test of milk, and so forth, cannot be evaluated exactly. Second, in considering the price to which producers have responded, the problem is difficult enough when the prices paid are prices offered to all sellers, but when these prices are restricted to certain producers, the evaluation of producers' response becomes very complex indeed.

Both these sets of circumstances have been important in Haverhill and are taken into account in the following analysis.

Each producer's market in the spring of 1939 is shown in figure 10. This shows the manner in which the two milksheds intermingle, a characteristic common to most parts of the state, and one dwelt upon in an earlier report in this series. In this chart, symbols have been used in such a way as not only to show the market to which shipment was being made at the end of the period, but also the number of times producers have changed from one market to the other in the eight years under study.

The most striking thing about this area is the extremely small number of persons who had changed markets. In general, the milksheds are divided in such a way that most producers ship to the nearest plant, though this is by no means true of everybody. Perhaps one reason for this situation is that a large number of producers in the area haul their own milk, consequently distance from market has a direct influence, often lacking when commercial truck routes charge a flat rate to all shippers.

Of a total of 102 producers, 90 did not change markets during the period of study and eight more changed only once. Only four producers made more than one shift. (These statements refer to shifts between the two markets, Boston and Manchester, and do not take into account shifts between individual handlers in the same market.)

The net change in the proportion of Haverhill producers shipping to Manchester is shown in figure 11. The absolute level of this percentage figure means little, as the limits of the area included are arbitrary and changing of the area would, of course, change the percentage. The relative change in per cent is the significant thing, and over the whole period this amounts to only three per cent or a change from 48 per cent to 51 per cent. This percentage figure has been placed on the same chart in

[1] "Milk Inspection in New England," Corbett, R. B., and Phucas, A. B., New England Research Council, 1937.
"Laws and Regulations Governing the Production of Grade B Milk in New England," Bressler, R. G. Jr., New England Research Council, 1938.
"Sanitary Laws and Regulations Governing the Production and Distribution of Dairy Products for Consumption within New Hampshire," MacLeod, Alan, New Hampshire Agricultural Experiment Station, 1937.

which is shown the net price advantage to Manchester shippers over Boston shippers.

No attempt at establishing a relationship between the relative advantage of Manchester over Boston and the per cent of producers shipping to Manchester in each particular month has been made. It is most unlikely that producers who shift markets as seldom as do most milk producers would respond to any particular month's differential and even though a desire to change markets has been felt, the obstacles in the way of such change may prevent for a considerable time or indefinitely, the actual change. Also, the effects of other factors than price have not been eliminated, and any conclusions based on correlation between the two series under consideration, even assuming various time lags, would be logically difficult to justify. However, if a price differential is continued over a long period of time, it may have a cumulative effect on producers. Just how long a differential must be in effect before it produces a shift, there is no way of knowing. However, if instead of pay-periods, a comparison of the same two series is made by yearly averages, with differing lags of the percentage shipping to Manchester behind that of the price differential series, a positive correlation might be found.

A more likely explanation of shifts between two markets, than that they take place in accordance with the differential price of one market over another, allowing for some definite time lag, is that following a price differential which has been sustained for a "sufficient" time, a reserve of producers is created who, given the opportunity, would shift to the higher priced market. But institutional factors may prevent for months, or even years, such shifts being made, though from the standpoint of price differentials they would be desired by many producers.

This is just another way of saying, that in this particular area, markets were not all free, and producers were unable for many reasons to respond to price differentials, even though such differentials may have been in effect for a number of years.

Of course, other factors mentioned above, have influenced producers to ship to particular markets. Such considerations as financial security, methods of sale, personal loyalties, etc., have been important. To some extent producers may have been unacquainted with price relationships between the two markets, though it is doubtful whether sustained differentials existed in this section without being apparent to most producers. But as long as prices paid are not available freely to any seller, long continued differentials between the two markets can continue and the working of free competition to bring prices (taking into consideration other factors of sale) into a stable competitive relationship may be indefinitely postponed.

The net shift of producers in the Haverhill area of only 3 per cent is in spite of the fact that in the first half of the period under study, Manchester prices were at a significant discount under Boston (without taking into consideration Grade A premiums), and in the second half, Manchester prices went to a large premium over Boston.

If judgments of future prices are made on the basis of past experience, the continued advantage of Boston over Manchester for 1931-35,

would have led producers to expect higher prices from Boston and if no other factors were taken into consideration and no obstacles to shifting were present, a transfer of sales from Manchester to Boston would be expected to result. And, in the last half of the period, after price relationships had changed in favor of Manchester, they would be expected to influence producers to leave Boston for Manchester.

And to a limited extent this has taken place. At least, during 1931-35 there was no sustained change in the number of producers shipping, whereas in 1935-39, there was a small but significant net increase in shippers to Manchester. But these changes have been very small, and are nothing like those which might be expected, had producers reacted to prices alone.

That forces, preventing change in market outlets, must be strong is shown, not by the small net changes throughout the period in the proportion of producers shipping, but by the large numbers of farmers who did not change their market throughout the period. This section has been largely devoted to a discussion of these forces. They are present whereever producers sell milk at wholesale, though of course their importance relative to the importance of price differentials varies greatly. In Haverhill, their importance is great; so great, that only one out of every nine producers has shifted between the Boston and Manchester markets in a period of eight years, (net change from beginning to end of period was 3 per cent) even though the country plants serving these two markets were only about 5 miles apart and the price differential between markets was at times substantial.

THE JEFFERSON, N. H. AREA

The following discussion covers for the town of Jefferson much the same ground gone over in the previous sections for Haverhill. Consequently, many of the points elaborated upon in that section are given much shorter treatment here. In general, the approach is similar and the technique used identical.

The Boston market through country stations in the town of Lancaster, and the Berlin market through city plants in Berlin, compete for milk in the town of Jefferson. Producers' markets in the spring of 1939 are shown in figure 12, which also shows the number of times producers changed markets in the eight years under study.

Historical

(a) *Berlin Shippers*

Some milk has gone from Jefferson to Berlin in each of the eight years preceding March, 1939 (the period covered by this study). It is necessary to go back some years earlier to find a time when no milk flowed in that direction. The first entrance of Berlin dealers into the area took place about 1920, when producers who were shipping to plants in Lancaster were persuaded to change their market.

These shipments to Berlin were often induced by the promise of high prices and other attractive terms of purchase. Unfortunately for producers, these promises were sometimes not fulfilled and many in-

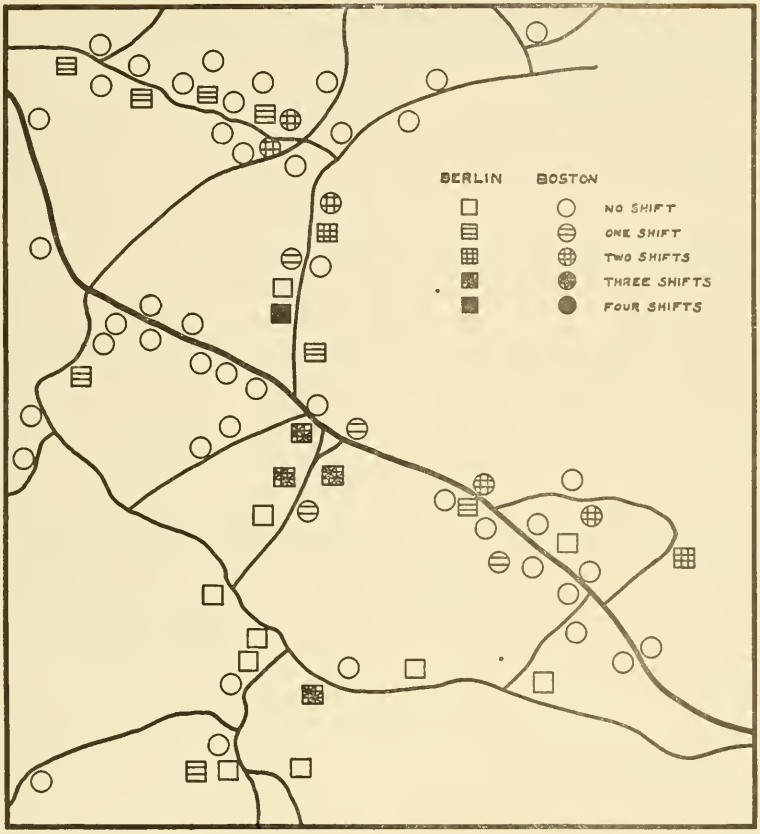

FIG. 12. JEFFERSON AREA SHOWING LOCATION OF FARM, NUMBER OF MARKET SHIFTS, AND MARKET, MARCH, 1939

stances of losses through financially irresponsible dealers are reported for this earlier period. Apparently, such conditions no longer hold, and Berlin dealers have largely overcome the mistrust engendered by these earlier experiences.

By 1931, conditions were more stable and a small group of producers were regularly sending milk to Berlin.

In April, 1932 Jefferson producers, dissatisfied with the prices being paid for their milk, organized a cooperative and stated a price below which they would refuse to sell milk. This strike was unsuccessful from the start. Many producers who had joined the cooperative continued to furnish milk and in a short time the strike, along with the cooperative, was ended.

Other efforts at increasing producer control of milk going to Berlin were made a little later when a few producers organized a cooperative distributing association and operated a plant in Berlin. Never very successful and finally encountering obstacles with regard to installation of

equipment satisfactory to public health authorities, this cooperative was forced out of business in 1936 and most of its producers were taken over by other Berlin dealers.

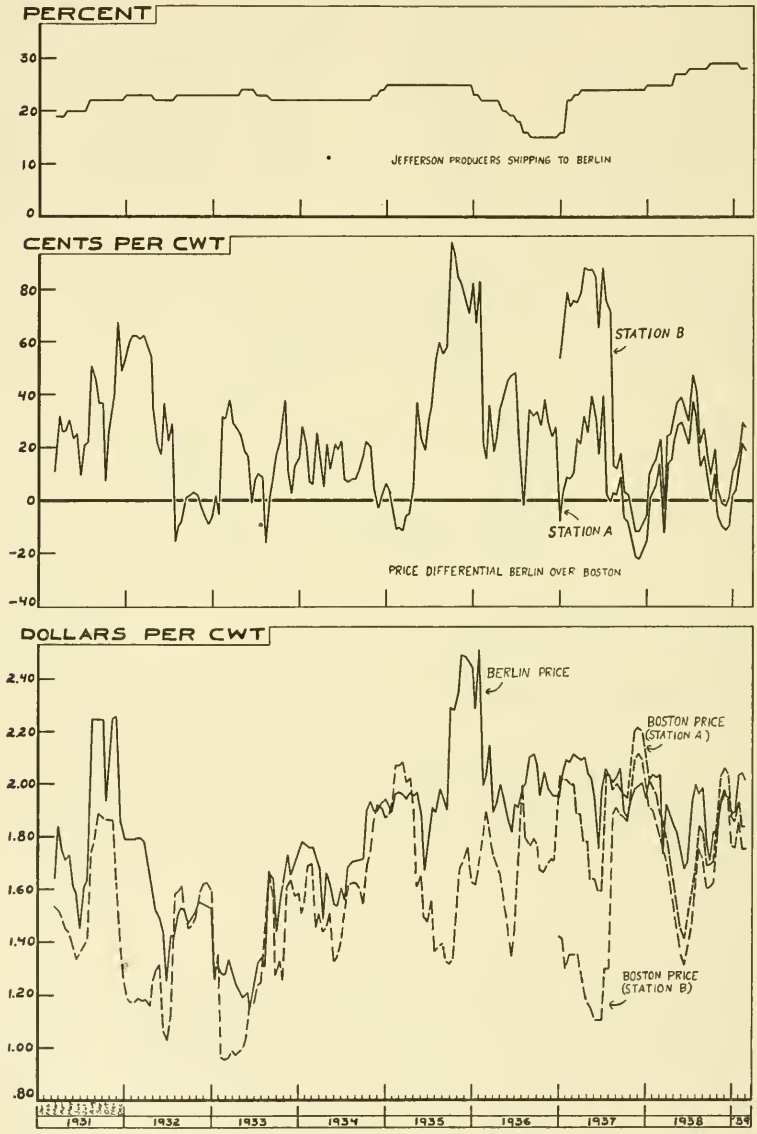

FIG. 13. PRICES AT THE FARM FROM BOSTON AND BERLIN MARKETS AND DIFFERENTIAL OF BERLIN OVER BOSTON TOGETHER WITH PERCENTAGE OF JEFFERSON PRODUCERS SHIPPING TO BERLIN [1]

[1] For data on which this figure is based, see Appendix Table VI.

In June, 1935, the first New Hampshire Milk Control Board set producer and retail prices in the Berlin market. The producer price schedule set up was sharply above that previously in force and above the Boston price in that area (see fig. 13). Had producers in the Jefferson area been paid on the same monthly surplus basis as they were for the year and a half preceding control, they would have received a net premium during control of *69 cents per cwt.* or *one and one-half cents per quart above the Boston return in the same area*

Actually, those producers in Jefferson who continued to ship to Berlin during the period of control did not receive this "hypothetical price", but received a somewhat lower return which averaged *46 cents per cwt. or one cent per quart above the Boston return in the same area.*

This increase in producer price was more than sufficient to stimulate Berlin dealers to look elsewhere than Jefferson for their milk, and the two largest dealers in that market shifted nearly two-thirds of their purchases from Jefferson to Maine, outside the New Hampshire Milk Control Board's authority. Shortly after control ended in November, 1936, purchases swung back again to New Hampshire.

The second New Hampshire Milk Control Board, in setting prices in Berlin made no drastic changes to the existing price structure in the market.

(b) *Boston Shippers*

Producers in Jefferson had been shipping to plants in Lancaster for many years before the period considered in this study. Ownership of plants had changed from time to time but throughout the years at least one buyer was always doing business and changes of the plant to which milk was delivered were few.

Considering the period under study, a single Boston plant received milk in Lancaster until December, 1936. In that month, a strike was called by some of the cooperatives supplying the Boston market and many Jefferson producers diverted their milk from the Lancaster plant. Within a short time of the calling of the strike, plans were made to build a cooperative plant in Lancaster and, while actual construction was not completed for some time, from December 1936, milk was received and paid for by the cooperative on the same basis as if a plant were in operation.

From the time the strike was called, two different composite prices have been paid to producers shipping to Lancaster, depending upon the organization to which the milk is delivered. For a few months, these prices differed materially, but since August 1939, the differences have amounted to only a few cents (an effect of the deduction of differing association dues, etc.).

Price Relationships Between Berlin, New Hampshire, and Boston

As was the case with Haverhill, and subject to the same qualifications, the price series used for comparison are composite prices with trucking costs and association dues deducted, expressed on a 3.7 per cent butterfat basis.

This price comparison is shown in figure 13 which shows the differential of Berlin prices over Boston prices and the percentage of producers in the Jefferson area selling to Berlin. From December, 1936, two series are given for Boston, representing the prices received (after deduction of dues and transportation) at the farm for milk delivered to each station.

Except for brief periods, Berlin prices have been consistently above Boston prices, even after taking into consideration the higher transportation charges to plants supplying the former market. For the whole period, a simple average for Berlin is 27.6 cents per cwt. above the price received by producers shipping to one Boston handler and 21.1 cents over that returned by the other Boston handler. This differential is by no means uniform, however, reaching high levels in the period August 1931-June 1932 and August 1935-July 1937, and at times dropping to below Boston for periods of several months duration.

If prices, alone, were considered, and if producers were free to select the market in which to sell, the relationships of the eight years preceding March 1939, might have been expected to result in a wholesale shift of producers away from the Boston, and to the Berlin, market. A sustained advantage in net returns from one market to another, other things being equal, should influence producers to sell in the market which yields the greater return.

Factors Other Than Price Which Influenced Jefferson Producers in Their Choice of a Market

In the corresponding section on Haverhill, a general discussion of the factors other than price which influence producers' choice of market was presented. Accordingly, in this section, it is proposed to confine the discussion to the importance of specific factors operating in the Jefferson area, and not to repeat the generalized treatment contained in the earlier section.

The first two factors considered are: (1) that handlers may limit the number of producers or the amount of milk which they will purchase, and (2) that existing contracts may prevent immediate release of producers from their present sales agencies.

Both of these obstacles to free producer movement were of importance in Jefferson. Particularly in the latter part of 1935, when Control Board action raised Berlin prices to their highest differential over Boston prices, Berlin dealers, instead of taking on more producers, dropped old shippers and procured a part of their milk in Maine. At other times, often when the Berlin market was most attractive, dealers in that market had all the milk they required and would-be-sellers were unable to enter the market.

Especially since 1937, when producers organized to build their own cooperative plant in Lancaster, a retarding influence on shifts to the Berlin market have been the contracts which were made with the cooperative. These contracts obligated the signer to send his milk to the cooperative for a definite period of years, after which he could make arrangements to sell elsewhere if he so desired.

Another factor tending to deter the shifting of markets is the use of a base rating system or some similar device, whereby a new producer has to take, for a time, a lower price than do regular producers. In Jefferson, after December 1936, producers selling to Boston were no longer paid on a base rating plan. Berlin producers, on the other hand, have received payment according to base rating plans throughout the period covered by this study; such plans, however, often assigning bases according to no very definite rule. Following the abandonment of the base rating system in the Boston market, a provision in the Federal Order required new producers in that market to accept Class II prices for the two months immediately following their entry into the market.

Different methods of payment and price quoting make it difficult for producers to compare prices. It is entirely probable that many producers in Jefferson were not aware whether the price which they received for milk in a particular month was higher or lower than that received by a neighbor for milk of comparable quality, because of the different methods of quoting prices. Berlin prices were usually quoted on a quart basis, Boston on a hundredweight. When to this difference were added different base-rating systems and butterfat differentials, the difficulty of comparison became great.

The factors associated with personal likes and dislikes have had an important influence in the Jefferson area. Loyalties between producer and handler were in many cases very strong. Likewise, strong dislikes have prevented producers from supplying particular handlers. Producers' suspicions (even though they may have been entirely unfounded) that rating systems were misused, false butterfat tests reported, or other unfair practices carried on, have been influential in determining to what handler milk was sold.

While evidence on the enforcement of sanitary regulation was difficult to obtain, studies made in 1937[1] indicated that Boston requirements were somewhat more rigorous than those of Berlin and were probably more stringently enforced, the Berlin health department being handicapped by small funds. Farmers who were questioned on the relative difficulty of satisfying the requirements of both markets, while not unanimous, generally believed that it was easier to qualify to ship to Berlin than to Boston, but that the difference was not great.

Particularly in the latter part of the period studied, an important factor to be considered was that producers selling to Boston had assurance that all of their milk would be accepted and paid for at the prevailing price. Those selling to Berlin, on the other hand, had in addition to a base rating system which required them to accept Class II price for all milk delivered above a certain quantity, no assurance that they might not be asked to keep at home a portion of their production.

Another factor in which the markets differed was in the reputation of their dealers for financial strength. A common observation, undoubtedly engendered by the past experience of certain producers who had

[1]Corbett, et al, opus cit.
Bressler, opus cit.
MacLeod, opus cit.

been left with substantial sums owing them by Berlin dealers who were financially weak, was that in selling to those handlers who supplied the Boston market, they were "sure of their money." Even though the losses incurred in selling to Berlin had been suffered some years past and the dealers responsible no longer purchased milk in the area, the feeling still persisted that payment was less sure in the Berlin market.

Market Response of Producers in Jefferson

This section should be read keeping in mind the more general discussion of the earlier section on Haverhill.[1] In that earlier section many of the considerations affecting producers' market response were considered at some length and material presented there is not repeated here.

In the absence of other market factors, price differentials such as those which existed between the Berlin and Boston market in Jefferson, would be expected to cause a shift of producers from the lower to the higher priced market.

Figure 12 shows each producer's market in the spring of 1939, and the number of times producers changed from one market to the other in the preceding eight years.

Figure 12 also shows that in a general way, the closer producers live to Lancaster, the more tendency there is for them to ship to that market, and likewise, though to a much less extent, the reverse holds true on the side nearest Berlin. This is to be expected, to the extent that hauling charges vary with distance, and in Lancaster this tendncy persists.[2] In Berlin, however, charges are the same, regardless of distance from market.

Perhaps the most noteworthy thing brought out by figure 12 is that the major part of the producers in the area made no shift in market throughout the period. More than one-half of those who did change, shifted only once and only one producer made as many as four changes or an average of one every two years.

In an effort to see whether producers who changed markets differed from those who remained constant throughout the period, the average qauntity of milk delivered per month for each group was calculated. (Table VII). No significant relationship is apparent between the amount

TABLE VII. AVERAGE QUANTITY OF MILK DELIVERED BY PRODUCERS IN JEFFERSON AREA (1931 - 39)[1]

	Quantity per month (pounds)
No change in market	4511
One change	4703[2]
Two changes	3650
Three changes	4433
Four changes	4178

[1] Includes 53 producers.
[2] Does not include one farmer with very large production.

of production and the tendency to change markets. Other characteristics of producers which might distinguish between those who remained with one market throughout the period studied and those who changed were

[1] See page 30.
[2] See MacLeod and Geraghty, opus. cit. p. 23.

not readily apparent, and it seems likely that if any differences exist they are largely psychological differences, some producers being more prone to try new markets than others.

The net change in the proportion of Jefferson producers shipping milk to Berlin, has been shown in figure 13. As in the case of Haverhill, the absolute figures are unimportant, being dependent upon the arbitrary limits selected for the area, but the relative change is significant. Contrary to Haverhill, a net change over the whole period of 11 per cent or a change from 19 per cent to 30 per cent was observed.

No attempt has been made to establish a relationship between the relative advantage of Berlin over Boston and the per cent of producers shipping to Berlin in a particular month. Milk producers shift markets so seldom that it is unlikely that they would respond to the differential of a particular month. Nor have the effects of other factors than price been eliminated.

However, it may be that a price differential continued over a long period of time may have a cumulative effect on producers, and there seems no doubt but that over the eight years, the sustained net price advantage for Berlin has brought about the shift to that market.

This study has not answered the question of how long a differential must be in effect before it produces a shift. Presumably the bigger the differential, the shorter is the period that is required. While a comparison of the two series by yearly averages, with differing time lags, might be made to yield a positive correlation, such a correlation may be largely a mathematical accident, because, to use one example, in 1935-36, when the price differential was high, new producers were not taken on by the Berlin market, and a number of old producers were dropped.

Another, and more probable explanation of shifts between markets is that following a price differential which has been sustained for some time, a reserve of producers is created who, given the chance, will shift to the market with the higher price. Institutional factors, however, may retard or even prevent such adjustments to price being made. Other factors than price must not be lost sight of, as they have influenced producers to ship to particular markets. Consideration such as financial security, methods of sale, personal loyalties, etc., have been important.

However, in spite of many of the factors other than price working in the direction of influencing producers away from the Berlin market, the percentage of producers selling to Berlin has increased from 19 to 30. This indicates the importance of price differentials in determining the channels through which milk flows to market.

Difficulties of Price Fixing by a State Agency in a Market Near a State Line

Before leaving the consideration of the Jefferson area, a part of the period under review can be made to yield information of value to control agencies, as well as to shed light on the effect of prices on milk supply.

[1] See page 31.

During the years 1934 - 37, some 31 producer-distributors and 16 dealers supplied the city of Berlin (population approximately 20,000) with milk and cream. A little over one-third of the milk was handled by producer-distributors and nearly two-thirds by dealers buying all, or most, of their milk from producers. Practically all of the producer-distributors lived to the north within a few miles of the city. In addition, most of the small dealers secured the bulk of their milk from this same section of the milkshed. The larger dealers, however, who supply about one-third of the market had to go farther afield for most of their supplies.

The normal area of supply for the large dealers had for some years before the advent of the Milk Control Board been in the town of Jefferson, distant by road about 21 miles.

To complete the picture of the Berlin market, it must be kept in mind that milk is available some 40 miles away in the state of Maine. Normally, this milk moves southeast to Auburn, but price relationships can become such that it will enter the Berlin market.

The first New Hampshire Milk Control Board had emergency powers to set producer and resale minimum prices. On June 15, 1935, it availed itself of those powers and set the following price schedule in Berlin: "Milk, retail in quart bottles—11 cents. Dealers to pay producers six cents per quart or $2.78 per cwt. for milk delivered at their plant and sold as fluid milk with a butterfat differential as set by the Boston Market Administrator. Surplus to be paid for at prices established by the Boston Market Administrator." Prior to the control board action, Class I milk had been paid for on the basis of $2.33 per cwt. ($2 per 40 quarts).

Prices paid by Berlin dealers to producers in Jefferson throughout the three years immediately preceding control averaged only 10 cents above the Boston prices in the same area.

The producer price schedule set up by the Control Board resulted in prices above those previously in force and also above the Boston price in the Jefferson area. Whereas the premium of Berlin price over Boston price (composite, at the farm in Jefferson with trucking charges deducted) for the year preceding control had averaged only seven cents per cwt., immediately after control the differential became very wide.

Had producers in the Jefferson area been paid on the same monthly surplus basis as they were for the year and a half preceding control, they would have received a net premium during control of 69 cents per cwt. or *one and one-half cents per quart above the Boston return in the same area.*

Prices set by a control agency are not only prices within an area at which producers may sell but also they are prices below which the distributor cannot buy. In most New Hampshire markets this distinction is meaningless as there is no alternative market, or markets, in which the distributor may buy—all are under the control of the agency or else are so distant that transportation expenses are too great to make them economically practicable. This is not so of Berlin. Within 45 miles milk is available in a market which, so far as the first New Hampshire Milk Control Board was concerned, was not under control. In other words, the

West Paris, Maine, area was a free market so far as the Berlin distributor was concerned, no minimum price below which he could not buy being in existence.

When this is the case, it is difficult to raise prices in a particular market beyond the point where milk purchased in that area becomes more expensive to the dealer than that which he can obtain in an uncontrolled market.

Normally, the net composite price in the West Paris, Maine, area received by producers selling to the Boston market, averages five cents per cwt. over that received by similar producers in Jefferson. In addition to this, transportation charges from West Paris to Berlin averaged six cents per cwt. over those from Jefferson to Berlin. Therefore, in order to procure milk from Maine, a dealer ordinarily would have to pay 11 cents per cwt. or approximately one-fourth of a cent per quart more at the plant in Berlin than he had been paying in Jefferson, and to the extent of this difference, a control agency could raise the net price to be paid in Jefferson without providing any price incentive for dealers to shift to Maine for their milk supply.

But the increase in price from $2.33 to $2.79 per cwt. for Class I milk at the city plant was more than sufficient to stimulate Berlin dealers to look elsewhere than Jefferson for their milk. It has been noted above, that anything over an 11 or 12 cent per cwt. increase in controlled New Hampshire markets would put the uncontrolled Maine markets in a favorable position, assuming, of course, that dealers and producers could shift from one market to another without trouble or expense. As a matter of fact the trouble and expense involved in such a shift are considerable and without sizable savings no shift is likely to be made.

In Berlin, potential savings were so large that the shift was made by the two largest dealers selling in that market. These dealers, selling between them some 2000 quarts daily in Berlin, shifted about two-thirds of their purchases from Jefferson to Maine when the Control Board came into the market. Shortly after control ended they were once more purchasing practically all of their milk in New Hampshire.[1] This supply of milk amounted to nearly one-half the milk purchased by dealers and about 30 per cent of all milk distributed in the city.

Other Berlin dealers made only small shifts in source of supply, though some stated that had the Control Board kept the same policy in operation they would have been forced to shift more of their purchases from New Hampshire into Maine.

This shift from New Hampshire to Maine sources of supply was not made without difficulty. The cooperative organization which was active in the Maine area opposed shift of producers away from their regular market.

A factor which made it easier for dealers to enter the Maine area was the establishment of a trucking service from Maine points. This service, which operated only during the period in which Berlin milk was under

[1]Prices offered at Auburn, Me., followed closely those of the higher Lancaster series, (see figure 13).

control, operated for approximately 29 cents per hundredweight as compared with 23 cents per hundredweight trucking charge on milk from Jefferson.

This movement of dealers away from Jefferson left a number of the producers in that area without a market and protests were made to the Control Board. Without authority to enforce minimum prices in Maine the Board was powerless to force dealers to continue buying milk from Jefferson producers. It did, however make certain price concessions to attract dealers to buy milk from that area. These efforts were not very effective but probably did prevent Berlin dealers from dropping a still greater number of their Jefferson producers.

On balance, producers in Jefferson were hurt, rather than helped, by Control Board activities during this period. While a handful may have received better markets because of the price schedules set up by the Board, many of them lost their markets entirely.

This incident demonstrated that a state control agency cannot set producer prices within the state appreciably above those at which milk can be obtained from an area outside its jurisdiction, without having a shift away from the controlled area into the uncontrolled, with resultant loss of market to producers within the state.

CONCLUSIONS REGARDING PRODUCERS' MARKET RESPONSES TO PRICE

While only two areas where markets compete for milk have been studied in detail, these two were carefully selected and the effects of certain factors upon producers were found to be similar. Accordingly, it is possible to generalize from the conclusions obtained in the study of these two areas to other areas of the Northeast.

A differential in prices of one competing market over another, will, if continued for a considerable length of time (several years) arouse a desire on the part of some of the producers in the lower priced market to shift to the higher priced market. Factors other than price, however, may be sufficiently potent to delay, or offset, or even reverse the action initiated by the price differential. For example, prices received by producers shipping to a particular market often are not available to new producers. In fact, frequently, producers wishing to begin shipments to a market may be unable to receive any price—the buyer may have sufficient milk and may refuse (or be unable) to accept additional quantities.

To the extent to which buyers are capable of exercising absolute control over the amount of milk they purchase, price differentials between markets are of secondary importance. This is especially true where control agencies set, and enforce, minimum prices for Class I and Class II milk, and consequently prevent price competition between handlers for milk going into a particular use. Composite prices within the market may still differ but with control over class prices, handlers may, by regulating their purchases of Class II milk, exercise great influence over the composite price which they pay.

Conditions of sale such as these are far from those usually though of as "free competition." Producers are not able to sell an unlimited quantity

of their product by offering it at a price slightly below the prevailing market. Nor are buyers able to secure large additional quantities by offering prices slightly above the market. Prices are what has been termed "administered," that is, they are set by governmental agencies, and are usually neither those that would be arrived at under conditions of free competition, nor those which a monopolist would set in order to obtain maximum revenue.

The control over class prices paid producers who sell to a market in which a control agency operates is usually complete, though individual handlers (except where there is a market-wide pool) may influence the composite price which they pay producers by varying their purchases and sales of milk. There is not the same control over either the amount of milk or the number of producers which a plant may receive. The individual handler can, apart from the influence of price, exert a great pressure in keeping producers from shipping to his plant, but can do very little in the direction of attracting them. Consequently, restrictions on the entry of a producer into the market become effective only when price and other factors attract producers. When the opposite situation is true, a handler's policy of exclusion is no longer an important influence.

Other important factors which exert an influence over producers' selection of a market might be grouped under price. These include such items as, promptness of payment, methods of payment, financial responsibility of the handler, reliability of weights and tests, and so forth. As was seen in the case of the Berlin market, past experience of financial loss were given considerable weight in selection of a market.

Still other factors are those having to do with sanitary laws and regulations. In recent years, various markets have set up standards for milk which must be met before a producer is permitted to supply milk to that market. Sometimes the requirements of one market are sufficiently different from those of the alternative market to involve trouble and expense in compliance.

Extremely difficult of evaluation are those important factors which are included under personal likes and dislikes. Where dealings with a buyer are continuous as they are in the case of a milk producer making daily deliveries, the importance of these personal factors is much greater than when sales occur only a few times a year. Loyalties, reputations for fair dealing, and dislikes often outweigh large price differences in the minds of producers.

Whatever the region, the decision of producers to sell to this market or that is based upon a great many considerations besides price. The weight given to each factor undoubtedly differs between producers, and the difficulty of isolating the influence of one particular factor is great. It has been possible, however, to examine separately each of these factors and to determine the direction in which it operates and to some degree its relative importance. By examining a particular area with the object of finding the factors which are present, together with something of their importance, an estimate can be made of the market response of producers to a long continued price differential between alternative markets. Such

an estimate cannot be reduced to refined quantitative terms, but it can be expressed within broad limits, such as "little or no shifting," "slight shifting," "considerable shifting," "much shifting."

These terms are unsatisfactory, but with so many of the factors impossible to evaluate mathematically, or to segregate or keep constant, no object would be served by attempting to use correlation analysis or by attempting to express the results in precise mathematical terms.

PRICES AND PRICE DIFFERENTIALS ON THE SUPPLY SIDE OF NEW HAMPSHIRE MILK MARKETS

In this study, prices received on the farm and prices paid at the dealer's plant have been under consideration. Earlier studies have analyzed the cost of country hauling which represents the major part of the differential between farm and plant prices.

This series of studies has not attempted to collect and publish price data. Not what prices are, but what makes them what they are and how they affect producers, are of primary concern. The studies of milk transportation yielded a method of reorganizing truck routes and market areas in such a way as to reduce charges and showed that present bases of charges are often indefensible and frequently include monopoly elements.

This final study of the series, after sketching briefly the historical background of milk prices in New Hampshire, shows how in a typical market, prices are not arrived at through any scientific basis, and, as in milk trucking, are certainly not those prices which perfectly competitive conditions would bring about. And yet these markets do not appear to be at all unstable. Apparently, it is normal for producers in New Hampshire markets to receive differing prices for the same quality milk, produced the same distance from market. Some of those differences may be explicable on the basis of differing seasonality of production, but most of them seem to have no place under condition of perfect competition. Here, as in so many other phases of the milk marketing process, those factors which may be included under the term monopolistic as applied to a particular handler, together with those having to do with personal relationships (to some extent these may be included under monopoly elements) are important.

When markets throughout the state are considered, prices are found to vary much more widely than any differences in transportation costs would justify. Here, it appears that prices have not been determined by competitive forces or by conditions of varying degrees of monopoly, but by a third set of conditions, namely, the action of administrative bodies. This is not completely true. Prices are set for milk going into two classifications; Class I and Class II, but the decisions as to the amount of milk going into each of these classes are made by the handler and the producer, and composite prices are a resultant of administered prices, handlers decisions as to the amount of Class II milk which they purchase, and the producers' decisions as to the amount of milk they offer for sale.

Apparently this condition of varying prices between markets with little reference to transportation costs or other economic factors, is not noticeably unstable. Such price relationships can exist for some time with-

out producing shifts of production from the low priced market to the high priced. Here again the explanation is not that the higher priced market is not attractive to producers, but that producers are unable to enter that market because there is no handler in the market who wishes to purchase milk from them.

At this point, it is necessary to touch on a matter that is outside the field of this study, but which has, where administered prices prevail, an important bearing on producer prices in a market. Handlers are primarily interested in disposing of milk in the forms in which it returns the largest net profits, which may not be those which bring the highest price to producers. "If certain class prices in federal and state orders are not well adjusted in relation to the prices whether retail or wholesale, at which milk can be sold in the various channels, distributors can be expected to divert supplies into those classes or channels offering unusual opportunities for profit. For this reason all of the class prices as well as the various adjustments and differentials applying to them, need to be reasonably well adjusted, not only to the prices prevailing for alternative sources of supply, but also with respect to the ultimate prices at which the various milk products can be sold. This is especially important where retail prices, based upon previously prevailing competitive relationships, are established by public regulation."[1]

These considerations throw light on the relative stability of what appear to be unstable price relationships, both between handlers in a particular market and between markets. Price schedules ordered by the New Hampshire Milk Control Board have tended to follow closer to those schedules previously operating in the markets than to a definite relationship to distance from the primary market, Boston. To the extent that prices and price spreads prior to milk control were such that handlers restricted purchases to certain classes and market outlets, control measures continued that situation. As a resultant of; (1) the price provisions of control agencies (both state and federal), and (2) plant facilities and markets, local New Hampshire markets handle relatively small quantities of Class II or surplus milk, while Boston distributors purchase large amounts. Consequently, producers ordinarily find it much easier to enter the Boston market than most local secondary markets: the fundamental reason being that the handler in the Boston market finds it more profitable to purchase Class II milk (above a certain minimum) than does the handler in the secondary market.

The latter part of this study investigates the market response of producers in two areas, to varying prices for milk. As might be inferred from earlier findings that both prices in a particular market and prices between markets could differ widely, without apparently causing unstable market conditions with producers constantly shifting from low to high priced outlets, the response of producers to large price differentials tended to be either retarded or overshadowed by the action of other factors. In any case response to price differentials is slow and appears to manifest itself by the creation of a desire to change markets, if and when

[1]Hammerberg, D. O., Proceedings of the Annual Meeting of the New England Research Council on Marketing and Food Supply, p. 32, 1940.

other factors involved in making the shift are favorable. The "trigger" which sets off the reaction, appears to be controlled often by the handler who decides when he wants to add or drop producers. Provided there has been built up a desire on the part of producers to shift from the lower to the higher priced market, the handler offering the higher price may influence producers to shift on short notice. However, in the absence of this underlying desire to shift, the handler's decision to add producers is likely to have little effect. The decision to drop producers is, of course, entirely in the hands of the handler and his decision to do so, results in a shift in market outlet regardless of price relationships and the resultant desires of producers.

Occasionally, producers either through cooperative action or individually retain the initiative in deciding where to sell. By finding alternative outlets either through existing channels or through erection or purchase of cooperative plants, or through marketing direct to consumers as producer distributors, producers may take the initiative in selecting their markets. This course sometimes involves the calling of milk strikes and sometimes results in duplication of plant and distribution facilities.

This study, together with the three preceding it, has been confined to the supply side of New Hampshire milk markets. Throughout this segment of the marketing of an agricultural commodity, the operation of what are termed the forces of free competition has been hard to find, and where discerned, has been so overshadowed by the influence of various institutional and monopolistic factors as to be of only secondary importance. Unfortunately, the institutional and monopolistic factors have not always worked in the direction of marketing efficiency. Over-capacity, duplication of equipment and wasted effort are all too commonly found in milk collection and assembly. Pricing mechanisms fail to reflect underlying conditions of supply and demand, not only of dairy products, but such items as transportation for milk, weighing and testing of milk and other cost items in milk assembly.

In its present form, elements of monopoly are too numerous to permit the free working of competitive factors, and monoply has not proceeded to the point where it can introduce many efficiencies of operation. Public control of prices has adopted (with only minor modification) price levels and differentials previously present in the market, and has not succeeded in bringing about economies of assembly. The operation of competitive forces has been overshadowed by these other two sets of price making forces and at the time these studies were made, the effects have not been happy.

APPENDIX TABLE I. PRICES RECEIVED BY PRODUCERS IN THE NASHUA AREA AT THE FARM, MARCH 1939

Price	No. Receiving	Price	No. Receiving
2.948	5	2.605	16
2.920	4	2.58	1
2.876	2	2.573	3
2.85	1	2.572	8
2.843	5	2.555	8
2.821	6	2.537	1
2.79	6	2.53	4
2.777	1	2.526	1
2.726	6	2.475	5
2.678	7	2.432	4
2.666	6	2.382	2
2.616	2	2.332	9

APPENDIX TABLE II. PRODUCER PRICES AT VARIOUS DISTANCES FROM NASHUA, N. H., MARCH, 1939

Distance from Market	Av. price per cwt.	Av. transportation charges per cwt.	Total
miles	dollars	dollars	dollars
0 - 2	2.697	.278	2.975
2 - 4	2.723	.269	2.992
4 - 6	2.666	.279	2.945
6 - 8	2.589	.288	2.877
8 - 10	2.583	.250	2.833
10 - 12	2.524	.255	2.779
12 - 14	2.544	.213	2.757
14 - 16	2.468	.217	2.685
16 - 18	2.497	.270	2.767
18 - 20	2.474	.350	2.824

APPENDIX TABLE III. INDIVIDUAL PRODUCER PRICES RECEIVED WITHIN A GIVEN RANGE OF MILES FROM NASHUA, N. H., MARCH 1939

Price per cwt. Dollars	Producers Number	Price per cwt. Dollars	Producers Number
2.948	1	2.537	1
2.79	4	2.53	1
2.605	2	2.526	1
2.573	1	2.382	1
2.555	4	2.332	4

APPENDIX TABLE IV. RELATIVE PRICES PAID AT PLANT FOR 3.7% MILK SOLD TO THREE MARKETS (BASE: MARCH 1, 1931-FEBRUARY 28, 1939)

Date		Berlin	Boston (N. Haverhill)	Manchester (E. Haverhill)
1931				
March	1 - 15	92.3	100.5	99.8
	16 - 31	102.1	100.3	100.4
April	1 - 15	97.6	99.0	98.2
	16 - 30	95.7	97.6	98.2
May	1 - 15	96.5	96.8	94.4
	16 - 31	90.9	95.0	94.4
June	1 - 15	89.6	93.2	95.5
	16 - 30	83.2	94.8	96.1
July	1 - 15	90.5	97.0	106.3
	16 - 31	91.7	97.9	106.3
August	1 - 15	121.8	118.3	115.1
	16 - 31	121.9	121.0	115.1
Sept.	1 - 15	122.0	124.5	114.2
	16 - 30	121.7	122.0	114.2
October	1 - 15	106.3	120.3	106.5
	16 - 31	115.0	118.5	106.5
Nov.	1 - 15	122.0	118.4	103.1
	16 - 30	122.2	101.0	103.1
Dec.	1 - 15	103.1	89.4	83.5
	16 - 31	99.3	81.5	83.5
1932				
Jan.	1 - 15	99.5	79.2	77.8
	16 - 31	99.5	78.2	77.4
Feb.	1 - 15	99.6	78.6	79.7
	16 - 29	99.8	79.1	78.9
March	1 - 15	99.8	78.7	79.8
	16 - 31	98.8	79.0	79.9
April	1 - 15	94.7	77.6	77.0
	16 - 30	89.8	82.1	77.1
May	1 - 15	85.2	86.0	72.6
	16 - 31	83.7	89.8	74.6
June	1 - 15	81.0	76.0	69.1
	16 - 30	72.4	76.2	67.6
July	1 - 15	80.5	80.4	79.5
	16 - 31	80.4	105.9	77.1
August	1 - 15	84.3	106.3	91.4
	16 - 31	85.8	105.9	91.6
Sept.	1 - 15	85.5	102.1	89.8
	16 - 30	82.8	98.8	91.9
Oct.	1 - 15	83.6	98.4	88.9
	16 - 31	85.0	99.9	88.3
Nov.	1 - 15	86.8	102.8	90.0
	16 - 30	86.4	104.2	89.6
Dec.	1 - 15	85.5	104.5	89.7
	16 - 31	85.2	103.4	90.5

APPENDIX TABLE IV (*continued*)

Date		Berlin	Boston	Manchester
1933				
Jan.	1 - 15	73.7	85.1	86.0
	16 - 31	74.9	90.7	86.4
Feb.	1 - 15	73.5	67.8	69.3
	16 - 28	72.9	66.8	69.5
March	1 - 15	76.2	66.8	66.0
	16 - 31	73.3	67.9	66.0
April	1 - 15	71.6	67.1	67.0
	16 - 30	70.6	67.2	66.6
May	1 - 15	69.2	68.4	66.5
	16 - 31	70.1	71.8	67.3
June	1 - 15	67.4	81.6	66.9
	16 - 30	71.6	81.7	66.1
July	1 - 15	75.6	84.2	79.1
	16 - 31	76.4	85.7	77.4
August	1 - 15	74.7	96.4	94.8
	16 - 31	92.4	109.0	94.9
Sept.	1 - 15	91.1	105.0	90.8
	16 - 30	81.3	88.7	92.4
Oct.	1 - 15	86.7	93.9	88.4
	16 - 31	90.6	86.2	86.9
Nov.	1 - 15	95.3	104.8	92.6
	16 - 30	91.8	106.0	92.2
Dec.	1 - 15	94.2	104.7	93.0
	16 - 31	95.9	103.5	92.7
1934				
Jan.	1 - 15	98.0	99.2	91.9
	16 - 31	97.3	102.1	91.9
Feb.	1 - 15	96.9	108.4	96.1
	16 - 28	96.9	108.9	96.1
March	1 - 15	94.3	93.9	95.8
	16 - 31	93.3	102.2	95.8
April	1 - 15	83.3	98.5	92.4
	16 - 30	91.9	100.5	92.4
May	1 - 15	90.3	100.4	90.5
	16 - 31	86.2	91.6	90.5
June	1 - 15	85.8	93.8	91.4
	16 - 30	89.3	98.8	91.4
July	1 - 15	87.2	105.7	96.2
	16 - 31	92.9	110.9	96.2
August	1 - 15	94.2	109.5	97.7
	16 - 31	94.2	108.2	97.7
Sept.	1 - 15	94.7	105.5	96.9
	16 - 30	94.5	103.5	96.9
Oct.	1 - 15	103.7	111.2	97.3
	16 - 31	105.4	112.8	97.3
Nov.	1 - 15	103.6	117.2	113.6
	16 - 30	103.6	120.1	113.6
Dec.	1 - 15	104.7	119.2	113.4
	16 - 31	105.5	116.9	113.4

APPENDIX TABLE IV (*continued*)

Date		Berlin	Boston	Manchester
1935				
Jan.	1 - 15	104.9	118.1	114.4
	16 - 31	103.4	120.9	114.4
Feb.	1 - 15	106.7	127.0	114.9
	16 - 28	107.0	127.3	114.9
March	1 - 15	106.8	128.0	112.2
	16 - 31	105.8	124.0	112.2
April	1 - 15	107.0	124.6	111.0
	16 - 30	106.1	118.3	111.0
May	1 - 15	107.0	112.5	110.0
	16 - 31	102.7	106.0	110.0
June	1 - 15	92.8	101.0	104.8
	16 - 30	97.3	101.7	104.8
July	1 - 15	104.0	107.0	104.6
	16 - 31	103.5	95.1	104.6
August	1 - 15	107.4	94.9	109.9
	16 - 31	105.9	95.5	109.9
Sept.	1 - 15	103.8	90.8	102.8
	16 - 30	122.8	90.8	102.8
Oct.	1 - 15	122.3	90.8	101.8
	16 - 31	125.5	97.0	109.1
Nov.	1 - 15	132.5	104.8	120.0
	16 - 30	131.9	106.6	120.0
Dec.	1 - 15	130.9	110.3	121.4
	16 - 31	130.1	103.4	121.4
1936				
Jan.	1 - 15	122.3	103.5	120.2
	16 - 31	133.4	107.0	120.2
Feb.	1 - 15	108.3	110.5	118.4
	16 - 29	110.2	115.3	118.4
March	1 - 15	116.1	110.5	113.9
	16 - 31	103.4	105.8	113.9
April	1 - 15	105.4	103.9	112.6
	16 - 30	108.5	102.3	112.6
May	1 - 15	105.6	98.5	103.0
	16 - 31	102.2	92.4	103.0
June	1 - 15	99.3	89.1	99.7
	16 - 30	104.6	95.0	99.7
July	1 - 15	104.3	108.2	114.9
	16 - 31	107.4	124.7	114.9
August	1 - 15	108.8	108.7	120.2
	16 - 31	113.7	107.1	120.2
Sept.	1 - 15	114.1	108.4	119.0
	16 - 30	112.2	106.3	119.0
Oct.	1 - 15	106.5	102.0	116.8
	16 - 31	110.5	101.0	116.8
Nov.	1 - 15	107.8	102.6	120.0
	16 - 30	106.2	103.6	120.0
Dec.	1 - 15	106.3	101.5	115.7
	16 - 31	105.9	88.0	115.7

APPENDIX TABLE IV (*continued*)

Date		Berlin	Boston	Manchester
1937				
Jan.	1 - 15	110.6	87.5	113.8
	16 - 31	113.1	81.8	113.8
Feb.	1 - 15	112.6	84.5	113.2
	16 - 28	114.0	84.5	113.2
March	1 - 15	113.7	84.5	110.3
	16 - 31	112.9	81.8	110.3
April	1 - 15	113.5	77.7	103.2
	16 - 30	110.5	74.7	103.2
May	1 - 15	109.4	73.6	103.0
	16 - 31	105.6	70.9	103.0
June	1 - 15	96.6	70.9	101.4
	16 - 30	107.3	70.9	101.4
July	1 - 15	111.5	81.8	107.4
	16 - 31	109.6	81.8	107.4
August	1 - 15	108.8	115.6	109.0
	16 - 31	109.7	117.0	109.0
Sept.	1 - 15	111.6	115.4	108.8
	16 - 30	103.4	114.9	108.8
Oct.	1 - 15	102.3	114.2	109.0
	16 - 31	105.2	120.6	109.0
Nov.	1 - 15	107.8	127.8	111.3
	16 - 30	108.4	128.7	111.3
Dec.	1 - 15	108.8	127.5	112.0
	16 - 31	105.6	122.0	112.0
1938				
Jan.	1 - 15	109.2	117.4	108.1
	16 - 31	109.9	116.7	108.1
Feb.	1 - 15	109.5	114.7	102.8
	16 - 28	109.9	110.8	102.8
March	1 - 15	96.0	109.3	100.9
	16 - 31	105.0	105.0	100.9
April	1 - 15	102.6	101.7	99.2
	16 - 30	100.8	96.3	99.2
May	1 - 15	99.3	91.4	92.8
	16 - 31	95.9	86.8	92.8
June	1 - 15	92.4	84.7	93.0
	16 - 30	93.9	89.2	93.0
July	1 - 15	105.4	92.9	100.3
	16 - 31	108.5	100.2	100.3
August	1 - 15	106.7	108.5	103.9
	16 - 31	107.8	106.6	103.9
Sept.	1 - 15	97.3	100.0	104.4
	16 - 30	93.9	100.4	104.4
Oct.	1 - 15	99.2	101.2	106.2
	16 - 31	99.1	109.3	106.2
Nov.	1 - 15	104.9	118.4	110.2
	16 - 30	106.7	120.9	110.2
Dec.	1 - 15	106.0	118.8	109.9
	16 - 31	103.0	109.6	109.9
1939				
Jan.	1 - 15	103.2	108.9	112.6
	16 - 31	110.3	113.7	112.6
Feb.	1 - 15	110.5	108.5	111.9
	16 - 28	109.3	108.5	111.9

APPENDIX TABLE V. PRICES RECEIVED AT THE FARM FROM THE BOSTON AND MANCHESTER MARKETS AND DIFFERENTIAL OF MANCHESTER OVER BOSTON, TOGETHER WITH PERCENTAGE OF HAVERHILL (N.H.) PRODUCERS SHIPPING TO MANCHESTER

Date		Manchester dollars per cwt.	Boston dollars per cwt.	Differential of Manchester over Boston dollars per cwt.	Percentage to Manchester
1931					
March	1 - 15	1.727	1.694	.033	48
	16 - 31	1.738	1.689	.049	48
April	1 - 15	1.696	1.666	.030	48
	16 - 30	1.696	1.641	.055	48
May	1 - 15	1.625	1.625	.0	48
	16 - 31	1.625	1.592	.033	48
June	1 - 15	1.646	1.560	.086	48
	16 - 30	1.657	1.588	.069	48
July	1 - 15	1.848	1.630	.218	48
	16 - 31	1.848	1.646	.202	48
August	1 - 15	2.014	2.020	—.006	48
	16 - 31	2.014	2.069	—.055	48
Sept.	1 - 15	1.997	2.134	—.137	48
	16 - 30	1.997	2.088	—.091	48
Oct.	1 - 15	1.853	2.156	—.303	48
	16 - 31	1.853	2.023	—.170	48
Nov.	1 - 15	1.788	2.022	—.234	48
	16 - 30	1.788	1.703	.085	48
Dec.	1 - 15	1.420	1.489	—.069	48
	16 - 31	1.420	1.344	.076	48
1932					
Jan.	1 - 15	1.312	1.302	.010	48
	16 - 31	1.306	1.285	.021	48
Feb.	1 - 15	1.348	1.292	.056	48
	16 - 29	1.333	1.301	.032	48
March	1 - 15	1.350	1.294	.056	48
	16 - 31	1.352	1.298	.054	48
April	1 - 15	1.298	1.274	.024	48
	16 - 30	1.300	1.356	—.056	48
May	1 - 15	1.215	1.427	—.212	48
	16 - 31	1.252	1.497	—.245	48
June	1 - 15	1.150	1.243	—.093	48
	16 - 30	1.122	1.248	—.126	48
July	1 - 15	1.345	1.324	.021	48
	16 - 31	1.299	1.792	—.493	48
August	1 - 15	1.569	1.800	—.231	48
	16 - 31	1.573	1.792	—.219	48
Sept.	1 - 15	1.539	1.723	—.184	48
	16 - 30	1.578	1.662	—.084	48
Oct.	1 - 15	1.521	1.655	—.134	48
	16 - 31	1.510	1.682	—.172	48
Nov.	1 - 15	1.543	1.736	—.193	48
	16 - 30	1.534	1.762	—.228	48
Dec.	1 - 15	1.537	1.767	—.230	48
	16 - 31	1.551	1.747	—.196	48

APPENDIX TABLE V (*continued*)

Date		Manchester dollars per cwt.	Boston dollars percwt.	Differential of Manchester over Boston dollars per cwt.	Percentage to Manchester
1933					
Jan.	1 - 15	1.467	1.411	.056	48
	16 - 31	1.475	1.514	—.039	48
Feb.	1 - 15	1.153	1.093	.060	48
	16 - 28	1.156	1.076	.080	48
March	1 - 15	1.091	1.075	.016	48
	16- 31	1.091	1.096	—.005	48
April	1 - 15	1.110	1.081	.029	48
	16 - 30	1.102	1.082	.020	48
May	1 - 15	1.100	1.105	—.005	48
	16 - 31	1.115	1.166	—.051	48
June	1 - 15	1.107	1.347	—.240	48
	16 - 30	1.092	1.349	—.257	48
July	1 - 15	1.337	1.394	—.057	47
	16 - 31	1.306	1.422	—.116	47
August	1 - 15	1.633	1.618	.015	47
	16 - 31	1.635	1.850	—.215	47
Sept.	1 - 15	1.558	1.775	—.217	47
	16 - 30	1.587	1.477	.110	47
Oct.	1 - 15	1.512	1.572	—.060	47
	16 - 31	1.484	1.431	.053	47
Nov.	1 - 15	1.592	1.772	—.180	47
	16 - 30	1.584	1.794	—.210	47
Dec.	1 - 15	1.599	1.770	—.171	47
	16 - 31	1.593	1.749	—.156	47
1934					
Jan.	1 - 15	1.577	1.670	—.093	47
	16 - 31	1.577	1.723	—.146	47
Feb.	1 - 15	1.657	1.839	—.182	47
	16 - 28	1.657	1.848	—.191	47
March	1 - 15	1.652	1.572	.080	47
	16 - 31	1.652	1.724	—.072	47
April	1 - 15	1.588	1.656	—.068	49
	16 - 30	1.588	1.694	—.106	49
May	1 - 15	1.552	1.692	—.140	49
	16 - 31	1.552	1.531	.021	49
June	1 - 15	1.568	1.570	—.002	50
	16 - 30	1.568	1.662	—.094	50
July	1 - 15	1.659	1.788	—.129	50
	16 - 31	1.659	1.884	—.225	50
August	1 - 15	1.687	1.858	—.171	50
	16 - 31	1.687	1.835	—.148	50
Sept.	1 - 15	1.672	1.785	—.113	50
	16 - 30	1.672	1.749	—.077	50
Oct.	1 - 15	1.680	1.890	—.210	50
	16 - 31	1.680	1.918	—.238	50
Nov.	1 - 15	1.986	2.000	—.014	50
	16 - 30	1.986	2.053	—.067	50
Dec.	1 - 15	1.982	2.037	—.055	50
	16 - 31	1.982	1.994	—.012	50

APPENDIX TABLE V (*continued*)

Date		Manchester dollars per cwt.	Boston dollars percwt.	Differential of Manchester over Boston dollars per cwt.	Percentage to Manchester
1935					
Jan.	1 - 15	2.000	2.016	—.016	50
	16 - 31	2.000	2.067	—.067	50
Feb.	1 - 15	2.011	2.180	—.169	49
	16 - 28	2.011	2.185	—.174	49
March	1 - 15	1.959	2.198	—.239	49
	16 - 31	1.959	2.124	—.165	49
April	1 - 15	1.936	2.135	—.199	48
	16 - 30	1.936	2.019	—.083	48
May	1 - 15	1.918	1.914	.004	48
	16 - 31	1.918	1.795	.123	48
June	1 - 15	1.821	1.703	.118	48
	16 - 30	1.821	1.715	.106	48
July	1 - 15	1.817	1.813	.004	48
	16 - 31	1.817	1.595	.222	48
August	1 - 15	1.917	1.591	.326	48
	16 - 31	1.917	1.601	.316	48
Sept.	1 - 15	1.782	1.515	.267	48
	16 - 30	1.782	1.515	.267	48
Oct.	1 - 15	1.764	1.516	.248	48
	16 - 31	1.902	1.629	.273	48
Nov.	1 - 15	2.106	1.773	.333	48
	16 - 30	2.106	1.805	.301	48
Dec.	1 - 15	2.132	1.873	.259	49
	16 - 31	2.132	1.747	.385	49
1936					
Jan.	1 - 15	2.110	1.748	.362	48
	16 - 31	2.110	1.813	.297	49
Feb.	1 - 15	2.075	1.877	.198	49
	16 - 29	2.075	1.964	.111	49
March	1 - 15	1.992	1.877	.115	49
	16 - 31	1.992	1.791	.201	49
April	1 - 15	1.968	1.755	.213	48
	16 - 30	1.968	1.726	.242	48
May	1 - 15	1.786	1.656	.130	49
	16 - 31	1.786	1.544	242	49
June	1 - 15	1.725	1.485	.240	49
	16 - 30	1.725	1.592	.133	49
July	1 - 15	2.011	1.835	.176	51
	16 - 31	2.011	2.137	—.126	51
August	1 - 15	2.109	1.843	.266	51
	16 - 31	2.109	1.814	.295	51
Sept.	1 - 15	2.088	1.838	.250	51
	16 - 30	2.088	1.799	.289	51
Oct.	1 - 15	2.045	1.721	.324	51
	16 - 31	2.045	1.702	.343	51
Nov.	1 - 15	2.106	1.731	.375	51
	16 - 30	2.106	1.750	.356	51
Dec.	1 - 15	2.026	1.712	.314	51
	16 - 31	2.026	1.465	.561	51

APPENDIX TABLE V (*continued*)

Date		Manchester dollars per cwt.	Boston dollars per cwt.	Differential of Manchester over Boston dollars per cwt.	Percentage to Manchester
1937					
Jan.	1 - 15	1.990	1.455	.535	50
	16 - 31	1.990	1.350	.640	50
Feb.	1 - 15	1.979	1.400	.579	50
	16 - 28	1.979	1.400	.579	50
March	1 - 15	1.924	1.400	.524	50
	16 - 31	1.924	1.350	.574	50
April	1 - 15	1.791	1.275	.516	50
	16 - 30	1.791	1.220	.566	50
May	1 - 15	1.786	1.200	.586	50
	16 - 31	1.786	1.150	.636	50
June	1 - 15	1.756	1.150	.606	50
	16 - 31	1.756	1.150	.606	50
July	1 - 15	1.870	1.350	.520	50
	16 - 31	1.870	1.350	.520	50
August	1 - 15	1.900	1.970	—.070	50
	16 - 31	1.900	1.996	—.096	50
Sept.	1 - 15	1.896	1.967	—.071	50
	16 - 30	1.896	1.957	—.061	50
Oct.	1 - 15	1.899	1.945	—.046	50
	16 - 31	1.899	2.062	—.163	50
Nov.	1 - 15	1.943	2.193	—.250	49
	16 - 30	1.943	2.210	—.267	49
Dec.	1 - 15	1.955	2.189	—.234	49
	16 - 31	1.955	2.087	—.132	49
1938					
Jan.	1 - 15	1.882	2.004	—.122	49
	16 - 31	1.882	1.990	—.108	49
Feb.	1 - 15	1.783	1.953	—.170	49
	16 - 28	1.783	1.882	—.099	49
March	1 - 15	1.747	1.855	—.108	49
	16 - 31	1.747	1.776	—.029	49
April	1 - 15	1.716	1.715	.001	49
	16 - 30	1.716	1.617	.099	49
May	1 - 15	1.594	1.526	.068	50
	16 - 31	1.594	1.442	.152	50
June	1 - 15	1.598	1.404	.194	50
	16 - 30	1.598	1.486	.112	50
July	1 - 15	1.736	1.554	.182	50
	16 - 31	1.736	1.687	.049	50
August	1 - 15	1.803	1.840	—.037	50
	16 - 31	1.803	1.805	—.002	50
Sept.	1 - 15	1.812	1.685	.127	50
	16 - 30	1.812	1.692	.120	50
Oct.	1 - 15	1.846	1.706	.140	50
	16 - 31	1.846	1.854	—.008	50
Nov.	1 - 15	1.922	2.021	—.099	50
	16 - 30	1.922	2.067	—.145	50
Dec.	1 - 15	1.917	2.028	—.111	50
	16 - 31	1.917	1.861	.056	50

APPENDIX TABLE V (*continued*)

Date		Manchester dollars per cwt.	Boston dollars per cwt.	Differential of Manchester over Boston dollars per cwt.	Percentage to Manchester
1939					
Jan.	1 - 15	1.968	1.848	.120	50
	16 - 31	1.968	1.936	.032	50
Feb.	1 - 15	1.954	1.840	.114	50
	16 - 28	1.954	1.840	.114	50
March	1 - 15	1.902	1.639	.263	51
	16 - 31	1.902	1.639	.263	51

APPENDIX TABLE VI. PRICES RECEIVED AT THE FARM FROM THE BOSTON AND BERLIN MARKETS AND DIFFERENTIAL OF BERLIN OVER BOSTON, TOGETHER WITH PERCENTAGE OF JEFFERSON PRODUCERS SHIPPING TO BERLIN.

Date		Berlin dollars per cwt.	Boston dollars per cwt.	Differential of Berlin over Boston dollars per cwt.	Percentage to Berlin
1931					
March	1 - 15	1.604	1.528	.112	19
	16 - 31	1.843	1.523	.320	19
April	1 - 15	1.750	1.486	.264	19
	16 - 30	1.710	1.449	.261	20
May	1 - 15	1.728	1.425	.303	20
	16 - 31	1.612	1.381	.231	20
June	1 - 15	1.586	1.332	.254	20
	16 - 30	1.454	1.357	.097	20
July	1 - 15	1.604	1.394	.210	20
	16 - 31	1.629	1.412	.217	22
August	1 - 15	2.247	1.735	.512	22
	16 - 31	2.250	1.787	.463	22
Sept.	1 - 15	2.251	1.885	.366	22
	16 - 30	2.245	1.873	.372	22
Oct.	1 - 15	1.929	1.863	.066	22
	16 - 31	2.108	1.860	.248	22
Nov.	1 - 15	2.251	1.857	.394	22
	16 - 30	2.255	1.579	.676	22
Dec.	1 - 15	1.863	1.377	.486	22
	16 - 31	1.785	1.247	.538	23

APPENDIX TABLE VI (*continued*)

Date	Berlin dollars per cwt.	Boston dollars per cwt.	Differential of Berlin over Boston dollars per cwt	Percentage to Berlin
1932				
Jan. 1 - 15	1.788	1.188	.600	23
16 - 31	1.788	1.166	.622	23
Feb. 1 - 15	1.791	1.170	.621	23
16 - 29	1.794	1.185	.609	23
March 1 - 15	1.796	1.179	.617	23
16 - 31	1.775	1.184	.591	23
April 1 - 15	1.691	1.156	.535	23
16 - 30	1.590	1.236	.354	22
May 1 - 15	1.518	1.295	.223	22
16 - 31	1.488	1.319	.169	22
June 1 - 15	1.431	1.065	.366	22
16 - 30	1.256	1.034	.222	22
July 1 - 15	1.421	1.128	.293	22
16 - 31	1.420	1.582	—.162	23
August 1 - 15	1.499	1.594	—.095	23
16 - 31	1.531	1.606	—.075	23
Sept. 1 - 15	1.524	1.515	.009	23
16 - 30	1.469	1.452	.017	23
Oct. 1 - 15	1.485	1.457	.028	23
16 - 31	1.513	1.489	.024	23
Nov. 1 - 15	1.550	1.577	—.027	23
16 - 30	1.543	1.616	—.073	23
Dec. 1 - 15	1.525	1.623	—.098	23
16 - 31	1.518	1.591	—.073	23
1933				
Jan. 1 - 15	1.281	1.263	.018	23
16 - 31	1.306	1.362	—.056	23
Feb. 1 - 15	1.277	.959	.318	23
16 - 28	1.265	.954	.311	23
March 1 - 15	1.332	.957	.375	23
16 - 31	1.273	.988	.285	23
April 1 - 15	1.238	.972	.266	23
16 - 30	1.218	.977	.241	24
May 1 - 15	1.189	.999	.190	24
16 - 31	1.208	1.042	.166	24
June 1 - 15	1.152	1.166	—.014	24
16 - 30	1.239	1.163	.076	23
July 1 - 15	1.321	1.226	.095	23
16 - 31	1.337	1.251	.086	23
August 1 - 15	1.302	1.464	—.162	23
16 - 31	1.667	1.655	.012	22
Sept. 1 - 15	1.640	1.555	.085	22
16 - 30	1.437	1.267	.170	22
Oct. 1 - 15	1.548	1.326	.222	22
16 - 31	1.629	1.250	.379	22
Nov. 1 - 15	1.726	1.609	.117	22
16 - 30	1.654	1.632	.022	22
Dec. 1 - 15	1.703	1.569	.134	22
16 - 31	1.738	1.578	.160	22

APPENDIX TABLE VI (*continued*)

Date		Berlin dollars per cwt.	Boston dollars per cwt.	Differential of Berlin over Boston dollars per cwt.	Percentage to Berlin
1934					
Jan.	1 - 15	1.781	1.500	.281	22
	16 - 31	1.766	1.554	.212	22
Feb.	1 - 15	1.758	1.686	.072	22
	16 - 28	1.758	1.700	.058	22
March	1 - 15	1.705	1.451	.254	22
	16 - 31	1.684	1.514	.170	22
April	1 - 15	1.479	1.426	.053	22
	16 - 30	1.655	1.442	.213	22
May	1 - 15	1.622	1.505	.117	22
	16 - 31	1.538	1.324	.214	22
June	1 - 15	1.531	1.343	.188	22
	16 - 30	1.602	1.386	.216	22
July	1 - 15	1.558	1.481	.077	22
	16 - 31	1.677	1.605	.072	22
August	1 - 15	1.704	1.620	.084	22
	16 - 31	1.704	1.620	.084	22
Sept.	1 - 15	1.713	1.600	.113	22
	16 - 30	1.710	1.541	.169	22
Oct.	1 - 15	1.898	1.677	.221	22
	16 - 31	1.933	1.729	.204	23
Nov.	1 - 15	1.895	1.850	.045	23
	16 - 30	1.897	1.923	—.026	24
Dec.	1 - 15	1.919	1.908	.011	24
	16 - 31	1.935	1.865	.070	25
1935					
Jan.	1 - 15	1.922	1.881	.041	25
	16 - 31	1.893	1.943	—.050	25
Feb.	1 - 15	1.960	2.066	—.106	25
	16 - 28	1.965	2.069	—.104	25
March	1 - 15	1.961	2.077	—.116	25
	16 - 31	1.942	2.001	—.059	25
April	1 - 15	1.965	2.019	—.054	25
	16 - 30	1.948	1.901	.047	25
May	1 - 15	1.966	1.597	.369	25
	16 - 31	1.877	1.647	.230	25
June	1 - 15	1.674	1.485	.189	25
	16 - 30	1.767	1.468	.299	25
July	1 - 15	1.905	1.546	.359	25
	16 - 31	1.894	1.362	.532	25
August	1 - 15	1.975	1.377	.598	25
	16 - 31	1.943	1.386	.557	25
Sept.	1 - 15	1.901	1.322	.579	25
	16 - 30	2.290	1.313	.977	25
Oct.	1 - 15	2.280	1.342	.938	25
	16 - 31	2.347	1.493	.854	25
Nov.	1 - 15	2.490	1.666	.824	25
	16 - 31	2.478	1.707	.771	25
Dec.	1 - 15	2.458	1.752	.706	25
	16 - 31	2.441	1.618	.823	23

APPENDIX TABLE VI (*continued*)

Date		Berlin per cwt.	Boston dollars per cwt. Sta. A.	Boston dollars per cwt. Sta. B.	Differential of Berlin over Boston dollars per cwt. Sta. A.	Differential of Berlin over Boston dollars per cwt. Sta. B.	Percentage to Berlin
1936							
Jan.	1 - 15	2.280	1.613		.667		23
	16 - 31	2.508	1.678		.830		22
Feb.	1 - 15	1.992	1.781		.211		22
	16 - 29	2.032	1.886		.146		22
March	1 - 15	2.153	1.797		.356		22
	16 - 31	1.893	1.716		.177		22
April	1 - 15	1.933	1.691		.242		22
	16 - 30	1.997	1.654		.343		20
May	1 - 15	1.937	1.548		.389		20
	16 - 31	1.868	1.414		.454		19
June	1 - 15	1.808	1.341		.467		19
	16 - 30	1.917	1.436		.481		18
July	1 - 15	1.910	1.681		.229		18
	16 - 31	1.975	1.996		—.021		16
August	1 - 15	2.003	1.791		.212		16
	16 - 31	2.104	1.764		.340		15
Sept.	1 - 15	2.111	1.792		.319		15
	16 - 30	2.072	1.746		.326		15
Oct.	1 - 15	1.955	1.671		.284		15
	16 - 31	2.037	1.658		.379		15
Nov.	1 - 15	1.982	1.687		.295		15
	16 - 30	1.949	1.706		.243		15
Dec.	1 - 15	1.952	1.669		.283		15
	16 - 31	1.943	2.031	1.415	—.087	.528	16
1937							
Jan.	1 - 15	2.040	2.006	1.405	.034	.635	16
	16 - 31	2.091	2.006	1.300	.085	.791	22
Feb.	1 - 15	2.080	1.996	1.350	.084	.730	22
	16- 28	2.109	1.996	1.350	.113	.759	23
March	1 - 15	2.103	1.876	1.350	.227	.753	23
	16 - 31	2.088	1.876	1.300	.212	.788	24
April	1 - 15	2.100	1.776	1.225	.324	.875	24
	16 - 30	2.037	1.776	1.170	.261	.867	24
May	1 - 15	2.016	1.626	1.150	.390	.866	24
	16 - 31	1.938	1.626	1.100	.312	.838	24
June	1 - 15	1.753	1.586	1.100	.167	.653	24
	16 - 30	1.972	1.586	1.100	.386	.872	24
July	1 - 15	2.059	2.036	1.300	.023	.759	24
	16 - 31	2.019	2.026	1.300	—.007	.719	24
August	1 - 15	2.004	1.974	1.879	.030	.125	24
	16 - 31	2.022	2.000	1.905	.022	.117	24
Sept.	1 - 15	2.060	1.971	1.876	.089	.184	24
	16 - 30	1.893	1.961	1.866	—.068	.027	24
Oct.	1 - 15	1.870	1.949	1.854	—.079	.016	24
	16 - 31	1.929	2.066	1.971	—.137	—.042	24
Nov.	1 - 15	1.983	2.197	2.102	—.214	—.119	24
	16 - 30	1.995	2.214	2.119	—.219	—.124	24
Dec.	1 - 15	2.004	2.193	2.098	—.189	—.094	24
	16 - 31	1.938	2.091	1.996	—.153	—.058	25

APPENDIX TABLE VI (*continued*)

Date		Berlin per cwt.	Boston dollars per cwt.	Differential of Berlin over Boston dollars per cwt.		Percentage to Berlin	
				Sta. A.	Sta. B.	Sta. A.	Sta. B.
1938							
Jan.	1 - 15	2.012	2.008	1.913	.004	.099	25
	16 - 31	2.025	1.994	1.899	.031	.126	25
Feb.	1 - 15	2.018	1.957	1.862	.061	.156	25
	16 - 28	2.025	1.886	1.791	.139	.234	25
March	1 - 15	1.739	1.859	1.764	—.120	—.025	25
	16 - 31	1.924	1.780	1.685	.144	.239	25
April	1 - 15	1.876	1.719	1.624	.157	.252	25
	16 - 30	1.839	1.621	1.526	.218	.313	27
May	1 - 15	1.808	1.530	1.435	.278	.373	27
	16 - 31	1.738	1.446	1.351	.292	.387	27
June	1 - 15	1.667	1.408	1.313	.259	.354	27
	16 - 30	1.696	1.490	1.395	.206	.301	28
July	1 - 15	1.932	1.558	1.463	.374	.469	28
	16 - 31	1.996	1.691	1.596	.305	.400	28
August	1 - 15	1.960	1.844	1.749	.116	.211	28
	16 - 31	1.983	1.809	1.714	.174	.269	28
Sept.	1 - 15	1.766	1.689	1.594	.077	.172	28
	16 - 30	1.696	1.696	1.601	.000	.095	29
Oct.	1 - 15	1.805	1.710	1.615	.095	.190	29
	16 - 31	1.803	1.858	1.763	—.055	.040	29
Nov.	1 - 15	1.922	2.025	1.930	—.103	—.008	29
	16 - 30	1.960	2.071	1.976	—.111	—.016	29
Dec.	1 - 15	1.946	2.032	1.937	—.086	.009	29
	16 - 31	1.883	1.865	1.770	.018	.113	29
1939							
Jan.	1 - 15	1.887	1.852	1.757	.035	.130	29
	16 - 31	2.034	1.925	1.845	.109	.189	28
	16 - 28	2.014	1.829	1.749	.185	.265	28
Feb.	1 - 15	2.038	1.829	1.749	.209	.289	28
March	1 - 15	1.980	1.628	1.548	.352	.432	28
	16 - 31	1.954	1.628	1.548	.326	.406	30